

COAL AGE

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The Blight Of Waste

BY BERTON BRALEY

Written expressly for Coal Age

The trees are black with dust and smoke,
The grass is burnt and sere,
The noxious gases from the coke
Pollute the atmosphere,
The valley droops as with a blight,
There is no vivid green,
And reeking ovens day and night
Make desolate the scene.

The land is dull and drab and bleak
And overcast the sky,
With heavy choking fumes that reek
And make the throat turn dry,
—Yet all the beauty that's defaced
And wearisome to see,
Is but the fruit of careless waste
A waste that need not be.

The smoke that pours into the air,
The dust that settles thick,
To make the valley grim and bare
The heart grow sore and sick,
This smoke and dust are golden gain
All lost before our eyes,
Because we will not take the pain
To have it otherwise.

"Byproducts"—what care we for these?
We only want our coke,
We'll go on flinging to the breeze
Our wasted wealth in smoke,
And though we know how much is lost
In soot and gas and flame,
We'll still refuse to count the cost
And waste it just the same.

For all the fumes and all the dirt
Which make the land so black,
Which float above it to its hurt
And leave it smirched and slack,
Are wasted wealth that won't return
But flees beyond recall,
And yet we cannot seem to learn
The pity of it all.

For if we ceased to foul the air
With murkiness and smoke,
We'd have our rich byproducts there
And also have our coke,
It would not prove a huge expense
The profits would be fat,
But it might need some common sense
—And who could hope for that!

Coal Shipping on the Great Lakes

By J. W. CHAMBERLIN*

SYNOPSIS—The second installment of this article. The different types of coal-loading apparatus are discussed and a general description of the growth of the Lake shipping given. A comparison of the trestle and car dump.

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A good indication of the trend of the coal trade on the lakes is shown by the following report of the Buffalo shipments in 1857: To Chicago, 24,879 tons; to Milwaukee, 2898 tons; to Detroit, 4567 tons; to Toledo, 1963 tons; to Cleveland, 2679 tons. The entire traffic in coal to the last three ports was cut off sometime ago by

not regularly listed, and which would probably round out the number to an even 400. Of these practically all are receiving docks from lake vessels except those located on the southern shores of Lakes Ontario and Erie (including Toledo), which receive from cars and deliver to vessels.

Besides the shipping trestles already mentioned as far west as Erie, practically all for anthracite handling except the one at Sodus Point, there are eight Lake Erie ports that ship bituminous more or less extensively, Ashtabula, Cleveland, Conneaut, Fairport, Huron, Lorain, Sandusky and Toledo, all in the State of Ohio. Being



ERIE RAILWAY COAL DOCK AT CLEVELAND, OPERATED BY THE PITTSBURGH COAL CO.; CAPACITY, 1200 TONS PER HOUR

the railroads (with the exception of a few small cargoes to Toledo) in spite of the fact that the long-distance traffic is so great and still growing. As lately as 1865 only 973 vessels passed through the Sault to Lake Superior, having a tonnage of 409,062 tons. The coal tonnage through that passage in 1912, not to mention other freight, was 14,931,594 tons, of which 12,789,109 tons was bituminous and 2,142,485 tons was anthracite. Of this amount 11,992,395 tons passed through the American or Poe lock and 2,939,199 tons through the Canadian.

There are about 350 coal docks on the Great Lakes, scattered all the way from Oswego on Lake Ontario to Chicago at the head of Lake Michigan and the twin ports of Duluth and Superior at the head of Lake Superior; this does not include the smaller docks on the north shore of Lake Ontario and the St. Lawrence River, which are

in easy shipping distance from the bituminous mines of Pennsylvania, West Virginia and Ohio they all load soft coal quite heavily in the lake trade, the railroads generally making a lower rate on such shipments, both from a desire to stimulate the trade and as a matter of competition with each other. The Lake Erie ports, including Erie, Penn., ship about 16,250,000 tons of bituminous coal, of which Ashtabula and Toledo are credited with more than half, with Cleveland and Lorain each running above 2,000,000 tons.

METHODS OF HANDLING

The methods of loading this coal have steadily developed from the wheelbarrow to the horse dock and thence to an elaborate and quite varied system of steam handling. In this connection it may be sufficient to mention the equipment at each port by name only. At Ashta-

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bula there are four McMyler car dumps; at Cleveland, six McMyler and one Wellman-Seaver car dumps; at Conneaut, one car dump; at Fairport, one McMyler; at Huron, two car dumps; at Lorain, two McMyler car dumps; at Sandusky, one car dump, one trestle; at Toledo there are seven docks, equipped with eight masts and booms (for receiving anthracite by lake) and for loading bituminous from car to vessel, three car dumps, one five-ton McMyler and one McMyler locomotive crane.

This immense bituminous traffic, being more than the entire output of all the bituminous mines of the United States in any year prior to 1871, is supplemented, and, in

the Lake Superior iron mines, carrying coal up to the head of Lake Michigan or Lake Superior and bringing down ore. If the ore goes to Chicago the distance is less, but there is no return cargo. Distance by lake from Buffalo to Duluth is 980 miles and from Cleveland to Duluth, 830 miles, while from Chicago to the mines at Escanaba the distance is only 274 miles.

CAR FERRIES

There are a good many car ferries on the lakes but only the two on Lake Erie and the one on Lake Ontario can be classed as coal carriers. The one running between



LOADING APPARATUS INSTALLED AT THE HARBOR IN ERIE, PENN.

fact, made possible at present low rates (which do not average 40c. a ton) by the great iron-ore trade in the opposite direction, which reached 48,211,778 tons in 1912. In former seasons, when ore was not so entirely in command of the situation, vessels easily obtained cargoes both ways, but now, with the ore tonnage nearly three times that of the coal, it is often found necessary to pay the vessels a living rate on ore alone, so that they can hurry back light for their ore, as there would be a loss of a matter of five days a trip in the case of the larger steamers should they load coal for the westbound trips.

WHEN SHIPPER OWNS HIS VESSELS

Where the ore shipper owns his own vessels he looks on the straight ore trade as easier to manage; the vessel owner without other lake interests, however, prefers to carry cargoes both ways. A good steamer will make about 31 round trips in a season between Lake Erie and



THE PITTSBURGH COAL CO.'S CAR-DUMPING MACHINE ON P. R.R. TRACKS, CLEVELAND, OHIO

Charlotte (near Rochester) and Coburg, Ont., and controlled jointly by the Grand Trunk Ry. and the Buffalo, Rochester & Pittsburgh R.R., is the most active of them all. Ice interferes sometimes, but Lake Ontario is very deep and does not freeze over readily. Charlotte shipped last year 1,107,436 tons of coal, nearly all bituminous, of which 324,814 tons went to domestic ports. It is expected that anthracite shipments from that port will increase steadily. Lake car ferries experience many storms and in winter are sometimes much hindered by both slush and heavy ice.

There are two coal-car ferries on Lake Erie. They were established in connection with the coal trade of various railroads. One runs between Conneaut, Ohio, and Port Burwell, Ont., and was established some 20 years ago by the Lake Erie & Detroit River R.R.; this company was absorbed by the Pere Marquette R.R., and the ferry is owned jointly by that interest and the Bessemer & Lake

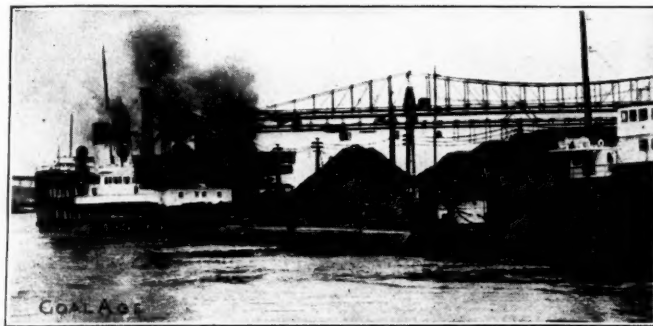
Erie R.R. The other runs from Ashtabula, Ohio, to Port Burwell and Rondeau, Ont. It is owned by the Canadian Pacific Ry. The ferries carry about 25 cars at a trip and cross back and forth as fast as possible. The Pere Marquette ferry has also a collier in connection, which carries in bulk, as most lake vessels do. Lake Erie is shallow and it is impossible in ordinary years to keep navigation open all winter. It was tried at the outset, but the ferry steamers were too often caught in the ice for either safety or profit. One steamer was lost two or three years ago with all on board.

There is also a car ferry on the St. Lawrence River between Ogdensburg and Prescott, that is, at least, indirectly connected with the lake trade, and formerly the ferries of Detroit River carried considerable coal into Canada, but the tunnels in that district are absorbing that business. The car ferries of Lake Michigan are active and run all the year, but they do not carry much coal. The object of these ferries is, of course, to shorten the distance between the mines and the consumers and also to get around blockades all-rail. As to the freight charges it is found that the Ogdensburg ferry rate is 15c. a ton, the rate from the Reynoldsville district, the source of the coal handled by the Lake Ontario ferry, is \$1.25 to Rochester, at one end of the route, and \$1.75 to Co-

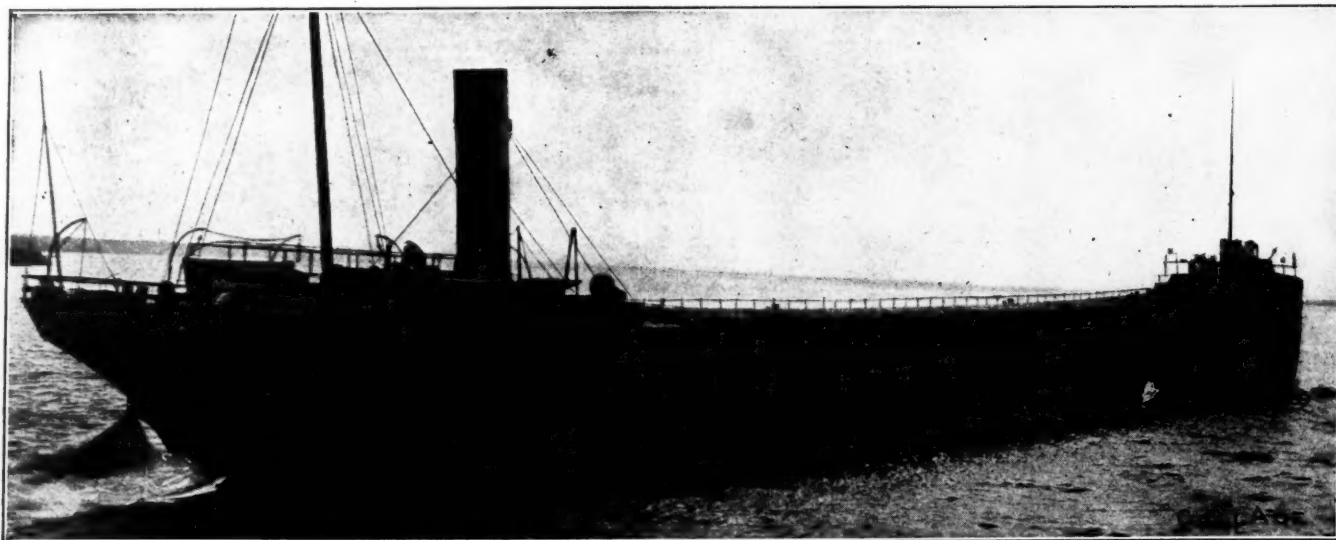
Lake Erie are mostly shallow and require a great amount of deepening; there is also much drifting sand so that constant dredging is often necessary. This sand appears to originate on the north shore, but it often crosses to the south shore. Before the long breakwater was built at Buffalo the sand piled up on the south beach so that a special sand-catch pier had to be built.

APPARATUS USED IN LOADING AND UNLOADING

Mention has already been made of the apparatus for handling coal from car to vessel at the lower-lake ship-



A "WHALEBACK" IN CONNEAUT HARBOR



FREIGHTER "J. C. WALLACE" (THE YELLOW KID). CAPACITY, 10,300 TONS; LENGTH, 530 FT.; BEAM, 56 FT.

burg, at the other end. The rate from Pittsburgh to London, Ont., is \$1.83 by ferry route and \$2.13 all-rail via Buffalo. These ferries often shorten the time between shipping point and destination considerably by avoiding the delays at junction points, as well as shortening the actual distance traveled.

The coal-car ferry idea has always been a favorite one on the lakes, where there is a large amount of coal passing around the end of any of the large lakes to the other side. The Grand Trunk Ry. took steps some time ago to provide itself with coal in Ohio and proposed establishing a ferry line from some Ohio point, perhaps Cleveland, to the Canadian shore. Preliminary arrangements were concluded and President Hays went to London and obtained the proper signatures authorizing the full carrying out of the plan; the contract went down with him in the "Titanic," on Apr. 15, 1912, and the new management has not again taken it up. The Canadian ports of

ping ports. These equipments are practically all efficient and ample, but such can hardly be said of that used at the docks on the upper lakes and the farther side of Lake Ontario. Some of it is very extensive, efficient and capable of taking 1000 tons an hour from the hold of a properly constructed vessel. There are 350 regularly listed coal docks on the lakes for unloading vessels and this list does not include the minor docks on Lake Ontario, some of which are hardly worth mentioning, as they receive only a hundred tons or so of coal in a season, and perhaps have no apparatus at all. The complete list is about 400.

Some of the big upper-lake coal ports are lavishly equipped for coal handling. Milwaukee, for instance, has 28 sets of handling apparatus, Duluth and Superior have together 29 and Chicago and South Chicago, 21. Some of these, of course, do not represent separate interests and some are massed more than one on a single dock, as where one dock in Milwaukee has 11 Brown

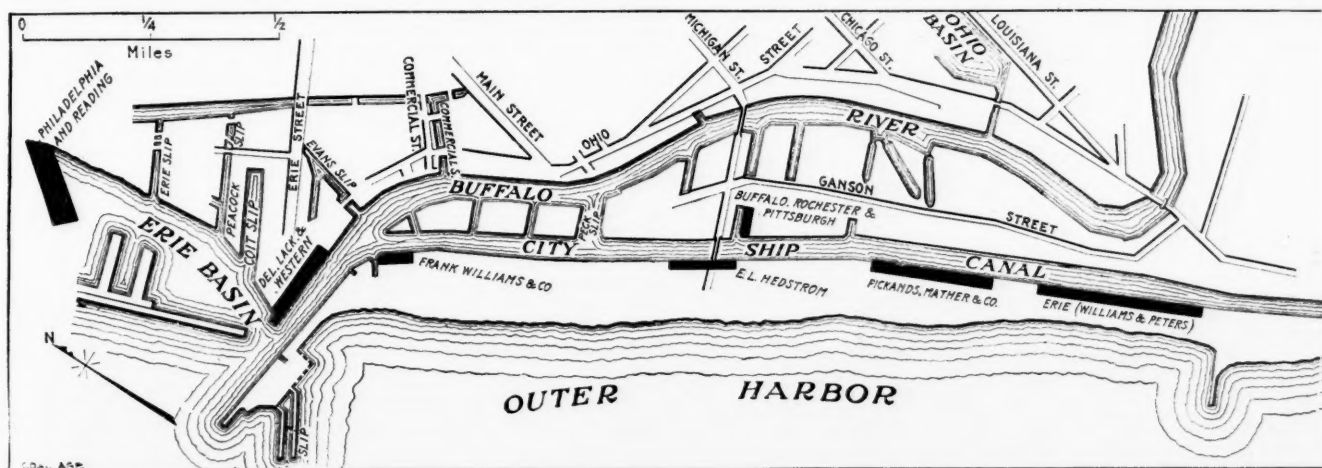
hoists, but they are commonly one at a dock. Included in the list of nearly 50 styles of hoist are rigs, whips, steam hoists, whirlies, McMyler's hoists, derricks, Mead hoists, hoisting boats, Mead-Morrison hoists, horse rigs, donkey engines, rigs with clams, Brown hoists, McMyler whirlies, Coney rigs, Hunt towers, clam-shell hoists, Heyl & Patterson fixed timber masts, Pittsburgh rapid bridges, no equipment, Robbins hoists, Hulett machines, masts and booms, swinging booms, Haiss hoists, friction hoists, booms and blocks, figure-four rigs (numerous), horse docks, hoist with clam, industrial rig, portable towers, nonportable rigs, Ellington hoists, steam drum, electric cranes, Fairbanks-Morse towers, Dodge rigs, McMyler bridges, Lockport whirlies, steam A-shaped rigs, hoisting boats, Parker derricks, Wellman-Seaver-Morgan hoists, dredges, revolving cranes and fixed masts.

These names, of course, run into each other in a way that would make it impossible to say just how many styles there are. In addition to these there are a few lake vessels that carry a simple hoisting apparatus on the deck for use where there is nothing available on the dock. They charge an extra freight and have a monopoly of non-

ton. Everybody in the business has figured on this loss, but the problem remains unsolved, as some coal breaks easier than others and some cargoes are also dumped further, while dry coal breaks up more readily. One shipper estimates that he gets only 86 tons of full sizes out of every 100 tons of anthracite shipped by lake; 7 tons is degraded into pea size, worth not much more than half its original value and 7 tons into screenings. A shipper once kept an estimate of a cargo of anthracite shipped from Buffalo to the Canadian Northern R.R. dock at Port Arthur, Lake Superior. It consisted of one-third egg and two-thirds stove and it came out 30 per cent. egg, 34 per cent. stove, 21 per cent. chestnut, 10 per cent. pea and 5 per cent. screenings. The change of size looks a trifle odd in some respects. However, every experiment of this sort will inevitably produce a new set of figures.

THE CAR DUMP

It is becoming evident that the end of the high shipping trestle is near; it has been an institution at lower-lake ports for a long time, but the car dump is now super-



PLAN OF HARBOR AT BUFFALO, N. Y., SHOWING COAL-SHIPPING PIERS

equipped docks. The capacity of these rigs varies almost with every dock on which they are found. The lowest capacity for mere bucket dock rigs is given at 250 tons per ten-hour day and the highest is 8000 tons. The fast docks are usually provided with several rigs of the same sort.

LOSS IN BREAKAGE

In connection with all the methods there is always the vexed question of breaking up or degradation of the coal, as it is called. The lake coal trade falls under the disadvantage of two or more extra handlings. If the coal, as is sometimes the case with anthracite, must be put into stock, at or near the shipping port, there is another handling to the stock pile and back to the car before it goes on board the vessel. The Delaware, Lackawanna & Western Co. has a stocking and transfer trestle at Cheektowaga, near Buffalo, a mile in length, and the Lehigh Valley Co. has a large one a few miles further east.

In case of most bituminous coal the loss from breaking up is not very great, as the slack is often worth nearly as much as mine-run and is generally within 50 to 75c. a ton of the large sizes. Anthracite, however, depreciates by breaking, as screenings are worth only about \$1 a

ton. A trestle has lately been torn down at Erie and a dump put in its place. Buffalo is already considering the change, one company having about concluded to give up its trestle and other shippers agreeing that they must go. The wooden trestle is cumbersome, taking up a large amount of expensive waterfront, which is all the time becoming more valuable. Then the expense of upkeep is large. After such a structure begins to get old it has to be fairly rebuilt every year or two to keep it in good working condition.

The dump is a new dock appliance and it did not work in very fast at first. The machinery must be heavy and is somewhat complicated, while the power required must be large to pick up a big steel car and its freight of 50 tons or more; the problem of dumping the coal where it is wanted is also a delicate one. The first dumps did little but turn the car over and empty it upon an apron, where the coal ran down into buckets, to be hoisted to the vessel afterward. The one used in Buffalo for handling the soft coal of the Rochester & Pittsburgh Co. was rigged so that the buckets were hoisted by the weight of the car as it came back to place. This made too many handlings of the coal and it was not long afterward planned to dump the car into the vessel direct.

Besides the relative cost and efficiency of the trestle and car dump, there is also the rapidity of handling and the breakage of the coal to be considered. All coal will break up considerably with any sort of handling, though in case of an empty vessel-hold the breakage is much more than after the cargo is nearly all in. Bituminous coal ships most satisfactorily in three-quarter size, though the preparation also involves the production of a large amount of slack. The problem is also complicated by

Shipments

Lake Ontario—		Tons	
Charlotte.....	185,000	Bituminous, to Coburg only	
Sodus Point.....	6,000	Anthracite, to Lake Ontario and St. Lawrence Ports.	
Sodus Poin.....	70,000	Bituminous, to Lake Ontario and St. Lawrence Ports.	
North Fair Haven	150,000	Anthracite, to various ports, including the upper lakes.	
Oswego.....	675,000	Anthracite, to various ports, including the upper lakes.	
Lake Erie—			
Buffalo.....	3,925,000	Anthracite, to upper lakes.	
Erie.....	275,000	Bituminous, to upper lakes, and to Lake Ontario.	
Erie.....	543,000	Anthracite, to upper lakes.	
Conneaut.....	165,000	Bituminous, to upper lakes and Lake Ontario.	
Ashtabula.....	4,370,000	Bituminous, to upper lakes and Lake Ontario.	
Fairport.....	375,000	Bituminous, to upper lakes and Lake Ontario.	
Cleveland.....	2,100,000	Bituminous, to upper lakes and Lake Ontario.	
Lorain.....	2,250,000	Bituminous, to upper lakes and Lake Ontario.	
Huron.....	735,000	Bituminous, to upper lakes and Lake Ontario.	
Sandusky.....	1,349,000	Bituminous, to upper lakes and Lake Ontario.	
Sandusky.....	17,000	Bituminous, to Buffalo.	
Toledo.....	4,630,000	Bituminous to upper lakes.	

Receipts

Upper Lakes—

	Anthracite Tons	Bituminous Tons
Alpena.....	3,000	126,000
Ashland.....	35,000	500,000
Buffalo.....		17,000
Chicago.....	947,000	600,000
Detour.....	10,000	151,000
Detroit.....		21,000
Dollar Bay.....	2,000	100,000
Duluth.....	190,000	2,370,000
Escanaba.....	20,000	475,000
Gladstone.....	2,000	220,000
Grand Traverse Bay.....		47,000
Green Bay.....	101,000	450,000
Hancock.....	167,000	440,000
Kenosha.....	29,000	20,000
Kewaunee.....	2,000	40,000
Lake Linden.....	13,000	390,000
Manistique.....	2,000	47,000
Manitowoc.....	29,000	495,000
Marine City.....	1,000	38,000
Marquette.....	31,000	303,000
Menominee.....	3,000	110,000
Milwaukee.....	1,080,000	3,080,000
Ogdensburg.....	21,000	190,000
Port Huron.....	3,000	117,000
Racine.....	43,000	100,000
St. Clair.....	1,000	55,000
Sault.....	29,000	140,000
Sheboygan.....	250,000	340,000
Superior.....	1,270,000	4,700,000
Two Harbors.....		253,000
Washburn.....	6,000	200,000
Waukegan.....	110,000	60,000
Passed through the Sault in 1912.....	2,142,000	12,789,000

ANTHRACITE SHIPMENTS BY LAKE FROM OSWEGO, NORTH FAIR HAVEN AND SODUS POINT, SEASON OF 1912, BY RECEIVING PORTS

New York			
Alexandria Bay....	6,300	Napanee.....	8,500
Cape Vincent.....	875	New Castle.....	1,200
Clayton.....	2,500	Oakville.....	1,500
Henderson Harbor.....	800	Pickering Harbor.....	900
Ogdensburg.....	25,000	Pictou.....	1,500
	35,475	Port Hope.....	1,800
Ontario		Port Milford.....	500
Bath.....	1,300	Portsmouth.....	600
Belleville.....	18,000	Prescott.....	3,700
Bowmanville.....	3,000	Smitas Falls.....	5,900
Brockville.....	23,000	Toronto.....	90,500
Bronte.....	600	Trenton.....	4,300
Cardinal.....	3,300	Whitby.....	1,800
Coburg.....	7,000	Wolf Island.....	1,000
Collins Bay.....	700		245,500
Conway.....	300	Quebec	
Descaronto.....	3,500	Chicoutime.....	1,800
Gananoque.....	10,500	Lachine.....	400
Hamilton.....	1,600	Montreal.....	270,000
Iroquois.....	2,300	Quebec.....	15,500
Kingston.....	45,000		287,700
Morrisburg.....	1,700		568,675

the action of the stokers, who sometimes refuse to handle anything but three-quarter in feeding their fires.

The use of the car dump has been much facilitated by the modern vessel hatch, which is so large that the deck

seems to be practically all hatch, in place of the old-fashioned style, which merely provided for an opening big enough for hoisting out a barrel or two. In all this improvement of late years it must be confessed that the lake coal trade has followed the iron-ore trade, which demanded rapid handling if costs were to be kept down. It is claimed that handling appliances on the lakes are usually far in advance of anything known on salt water and with good reason, for the trip never exceeds 1000 miles, so that time lost in port is fatal. In case of ocean vessels there must be time in port for repairs and speed in handling is not so essential.

The Coke Made from West Virginia Coal

The quantity of coke made in West Virginia in 1912, according to E. W. Parker of the U. S. Geological Survey, was 2,465,986 short tons valued at \$4,692,393. In 1911 the production was 2,291,049 tons valued at \$4,236,845. The increase in 1912 was 7.64 per cent. in quantity and 10.75 per cent. in value. In spite of this increase the production of coke in West Virginia in 1912 was smaller than that of any year from 1905 to 1910. The smaller production in the last two years is attributable simply to the larger production of coke from West Virginia coals by plants in other states.

In 1912 the quantity of coal made into coke in West Virginia was 4,061,702 short tons, while it is probable that the quantity of West Virginia coal made into coke outside of the state exceeded 5,000,000 short tons. In coke making as in the coal-mining industry, West Virginia suffers from having relatively little home consumption for her products; 80 per cent. of the coal mined in the state and nearly all of the coke made there is sent to consumers outside of her boundaries.

Next to Pennsylvania, West Virginia possesses more wealth in supplies of high-grade coal than any other state in the Union, but as long as both coal and coke continue to be shipped out of the state, West Virginia will not attain the position she should occupy as a manufacturing commonwealth. At the present time ranking second in the production of coal and third in the production of coke, West Virginia stands thirty-fourth in the value of her manufactured products.

Richmond Basin in Virginia

The presence of coal in the Richmond basin of Virginia was known as early as 1700 and mines were opened and worked in 1750. In 1789 shipments were made to some of the Northern states. In 1822, according to R. C. Taylor in his "Statistics of Coal," the production amounted to 54,000 short tons. For nearly a century the Richmond basin maintained some prominence as a coal producer, but in 1882 when the Pocohontas district was opened, followed shortly afterward by the development of the New River field in West Virginia, the mines in the Richmond basin were put at a disadvantage, and operations were for many years practically suspended.

During the last four years, however, new life has been introduced into the Richmond basin areas by the reopening of the old Gayton mine in Henrico County. This region is the only area producing free-burning coal which lies immediately adjacent to the Atlantic seaboard.

Large Coke Production in Indiana

The production of coke in Indiana in 1912, according to E. W. Parker of the U. S. Geological Survey, amounted to 2,216,339 short tons valued at \$12,528,685.

With the completion and putting in operation of the 560 Koppers ovens by the United States Steel Corporation at Gary, Indiana in 1912 advanced to third place among the coke-producing states, displacing West Virginia, Illinois and Colorado. Indiana's production in 1912 exceeded that of West Virginia by about 150,000 tons and was only 350,000 tons or thereabouts less than that of Alabama.

It is probable that within two years if not in 1913 Indiana will surplant Alabama as the second coke state as at the close of 1912 there were 169 retort ovens in course of construction.

In addition to the ovens at Gary there were 50 Otto ovens operated by the Citizen's Gas Co. at Indianapolis, and during the year 22 ovens were completed by the Central Indiana Gas Co. at Muncie. These latter ovens are heated by producer gas made from the coke in producers in front of and below the ovens. Gas coal from the Youghiogheny region of Pennsylvania is used in these ovens and the coke is marketed for domestic consumption. The coal used at Gary and Indianapolis is chiefly from West Virginia.

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Maryland's Coal Output

Maryland's coal production has been fairly constant for the past 15 years, during which period it has averaged about 4,860,000 short tons. The smallest annual output was 4,023,241 short tons, while the maximum was 5,532,628 tons in 1907. The production in 1912 was 4,964,088 short tons, valued at \$5,839,079. These figures were compiled by E. W. Parker, of the U. S. Geological Survey, having been obtained in coöperation with the Maryland State Survey.

This production was about 100,000 tons over the average for the 15-year period, but more than 600,000 tons less than the maximum; compared with 1911, the production in 1912 was a gain of 278,243 short tons in quantity and \$642,013 in value. In sympathy with the generally higher values throughout the country in 1912, the average price per ton for Maryland coal advanced from \$1.11 in 1911 to \$1.18 in 1912.

The coal deposits of Maryland are confined to a small area in the two western counties of the state, Allegheny and Garrett. Most of the production in the past has been made in the Georges Creek basin, which, in Allegheny County, contains a detached portion of the Pittsburgh seam, known generally as the Maryland Big Vein. This bed has been worked for nearly a hundred years and is now approaching exhaustion. The greater prominence of this basin as the source of Maryland's coal products has given the name Georges Creek to most of the coal shipped from the state.

Georges Creek coal has a high reputation as a steam and blacksmith fuel. The gradual exhaustion of the big vein has led to the exploitation of some of the smaller beds in the Georges Creek basin, and many companies that formerly worked the Big Vein only are now mining the thinner beds, either independently or in conjunction with the Big Vein.

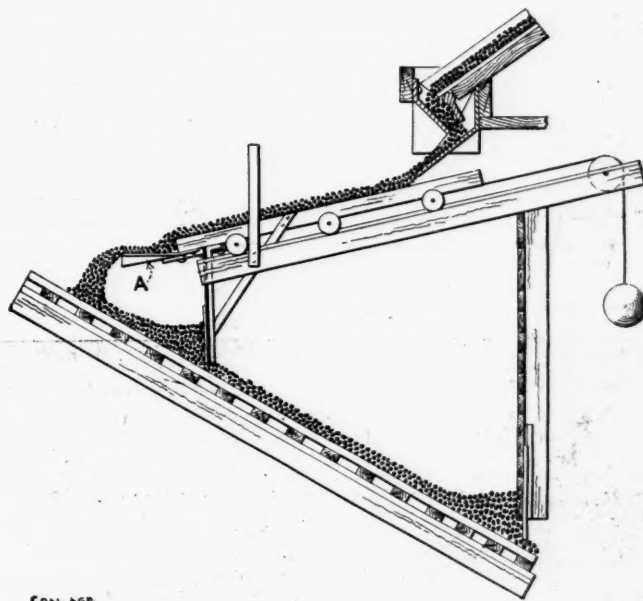
The total amount of coal recoverable from the numerous small beds far exceeds the original contents of the Big Vein, but they cannot be so cheaply worked, and it appears doubtful if in annual production they will do more than make up the deficiency caused by the exhaustion of the larger deposits.

The U. S. Bureau of Mines reports a total of only 13 men killed in the coal mines of Maryland in 1912, a decrease of two from 1911, when there were fewer men employed and fewer tons mined. Maryland also presents an excellent record in regard to labor troubles, of which there were only three in 1912, the longest one lasting for 12 days. No strike of any kind was reported in either 1910 or 1911. Most of the mines are operated ten hours per day.

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Traveling Chute for Coal Pockets

One of the objects of the device shown in the accompanying figure is the provision of a traveling or movable chute operative upon an inclined track, the chute being provided at the lowest end with a spreader plate A for evenly spreading the coal in the upper portion of the pocket, against a regulating plate projecting downwardly from the under surface of the lowest end of the movable chute. As the coal piles up against the regulating plate the chute is moved upwardly upon the inclined track, so as to gradually regulate the coal down the incline of the pocket, where it passes through a gate opening.

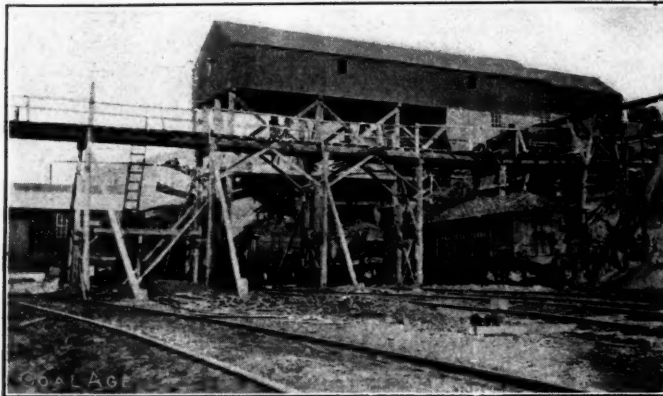


COAL AGE

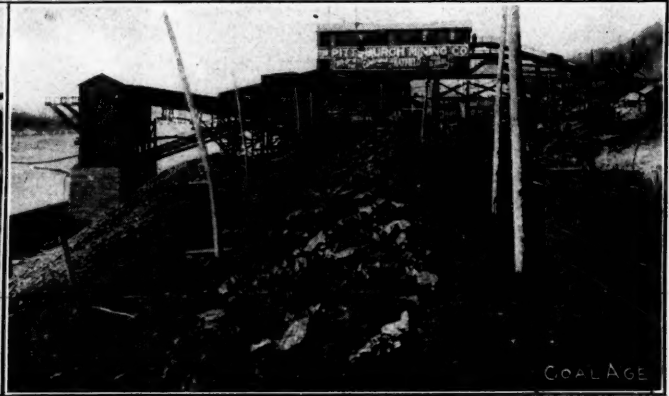
THE CHUTE IN OPERATION

In practice there is a series of pockets, and each gate opening of each pocket is opened or closed by means of a gate, there being an attendant, known in practice as a "loader," for operating each gate. When it is desired to load a car at the gate opening, the "loader" gives a signal, and the coal is allowed to pass from the coal regulator, upon the traveling chute, from which it is spread into the pocket, then the "loader" opens the gate, thus allowing the coal to flow into the car. A patent (1,061,151, May 6, 1913) was granted on the above chute to W. N. White of Fortyfort, Penn.

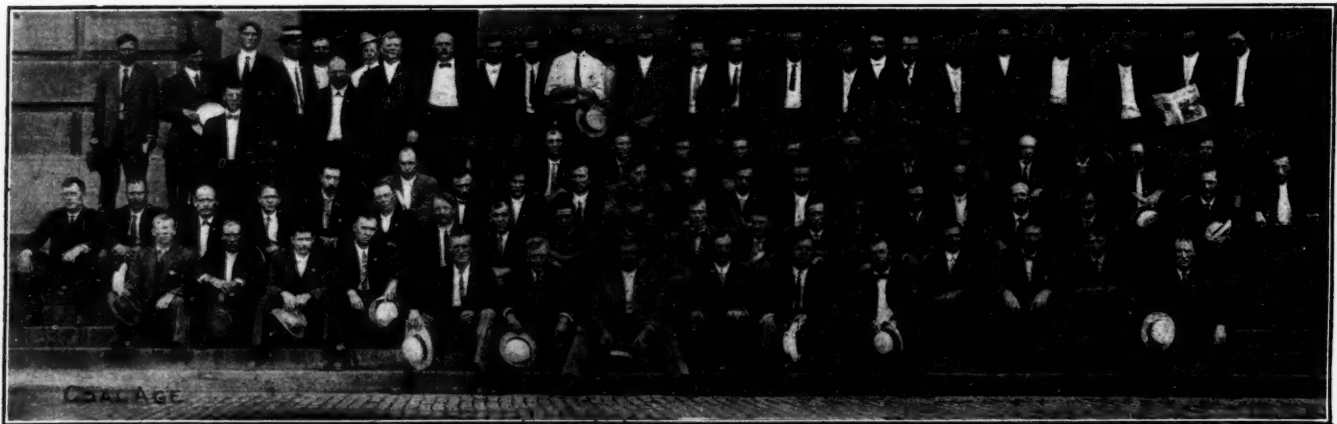
SNAP SHOTS IN COAL MINING



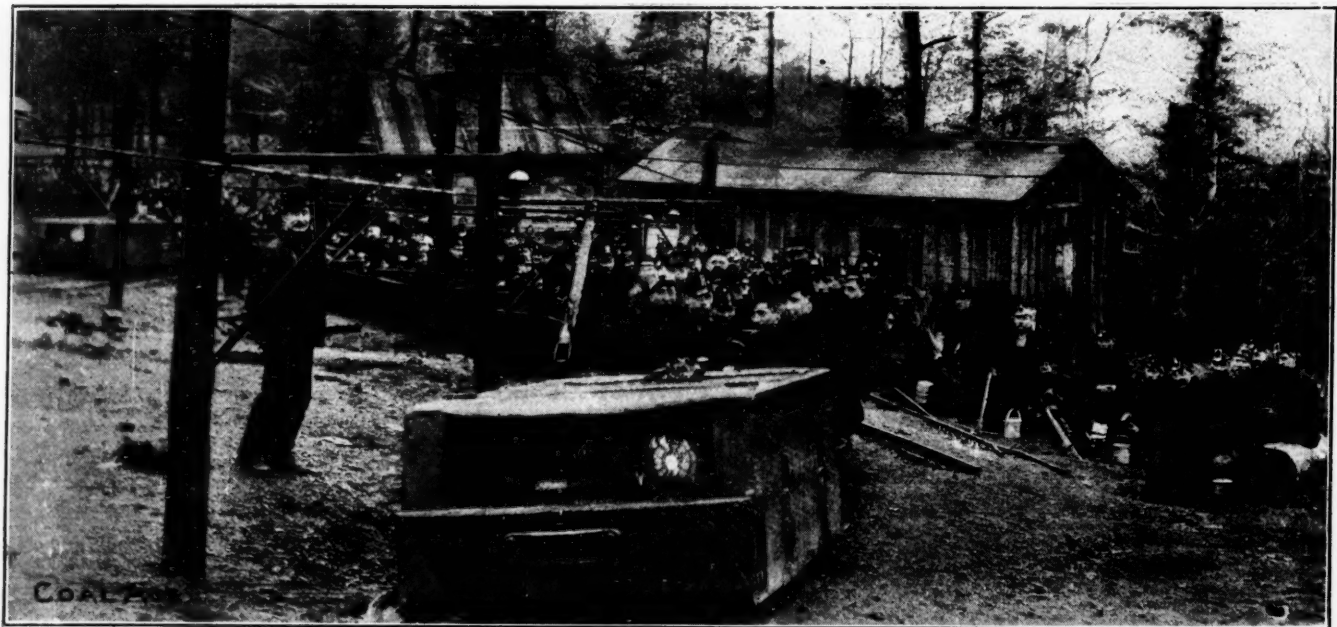
TIPPLE OF THE INTERNATIONAL COAL CO., CARBON COUNTY, MONT.



NEW RAIL AND RIVER TIPPLE OF PITTSBURGH MINING CO., MINERSVILLE, OHIO



MEN WHO TOOK THE MINE MANAGER'S, MINE EXAMINER'S AND HOISTING ENGINEER'S EXAMINATION, SPRINGFIELD, ILL., JUNE 16



THE MAN TRIP ABOUT TO ENTER THE NANTYGLO COAL CO.'S MINE AT NANTYGLO, PENN.

The Industrial Importance of Coal

BY FREDERICK W. SAWARD*

SYNOPSIS—An interesting paper in which some facts and figures on the importance of coal are presented. It has been quite pertinently said the coal production must continue so long as a wheel is to turn any place. The possible results of a general and abrupt cessation in production are discussed and the gradual development of the industry reviewed.

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The consumption of fuel is the best measure and truest index of a nation's industrial status, but notwithstanding the extent of the coal trade today, which statistics available to all plainly make evident, it is a lamentable fact that the industry has had much to contend with in past years in the way of adverse public sentiment and lack of esteem. Too often even now the personnel of the trade is collectively regarded either as a robber baron swollen with ill-gotten gains or a more or less prosperous peddler delivering his tonnage with a horse and cart, while only some vague ideas of dust, dirt and a deep hole give shape to the more general features of the trade.

LITTLE EARLY INCENTIVE TO DEVELOPMENT

With little in the way of incentive to development, and with such limited opportunities for traffic in coal as existed a century or more ago, it is easy to believe that the industry appealed only to a nondescript element of the population and there was not the opportunity for anything like the facilities that we see in common use today. We may well shudder to think of the severe underground work performed by women in the old coal mines of Britain. Their tasks would be put today under the heading "cruel and unusual," and the men indeed were little better off, for such work as carrying coal in baskets up crude ladders lining a shaft may well appall the workman of today, who insists upon no more than eight hours of work that is none too severe. Even the employment of dogs today in such underground work as then prevailed would call forth protests from a certain society with a long name.

How little the industry was esteemed may be gleaned by a few lines taken from Adam Smith's celebrated work on "The Wealth of Nations," the great classic among economic writings. This was written, I might say, at Kircaldy, whence (including Methill) the largest export of Scotch coal is now made. Professor Smith stated: "Coals are a less agreeable form of fuel than wood, and they are said to be less wholesome. The expense of coal, therefore, at the place where it is consumed must generally be somewhat less than that of wood."

THOUGHT COAL COULD NOT COMPETE AT A DISTANCE

The production of distant coal mines can never be brought into competition with one another. He, however, condemned the duty on their exportation, which was then in most cases more than the value of the commodity at the pit, or even at the shipping port, on the ground that it is always inexpedient to restrain the export of "the instruments of trade."

*Editor, "The Coal Trade Journal," New York.

Note—Abstract of paper read before the joint annual convention of the M. O. I. Coal Association and the Kokoal, at Cedar Point, Ohio, June 17, 18 and 19.

Charles Dickens made light of the coal trade as the last resort of the unsuccessful man, and even our own Chauncey M. Depew, in later life identified with coal companies, in one of his earlier addresses supported in a measure the Dickens view of the coal man. Also, the railroad people of the early days were slow to see the possibilities of coal as a traffic producer. At the time of the English coal development—and, as you all know, it was in that country that the mining of coal first became an established industry—shipments were made largely by water, short tram roads affording access to navigation.¹

Even when the railroad era was well under way coal was not considered in the light of legitimate traffic, though a supply of it was provided at terminals for locomotive purposes. It is one of the traditions of the English trade that when a pioneer coal-mining company made application for a freight rate on coal the officials of the road approached were so much surprised at the novel proposition that they submitted it to the board of directors, causing one of these worthies to exclaim with astonishment and indignation: "Carry coal; next they'll want us to carry dung!"

Presuming, then, that the coal trade as an important industry started with the utilization of steam power on a large scale, it ranks as distinctively a modern enterprise, and considering the relatively short period of its growth the achievements have been remarkable. Statistics show that the coal tonnage of the world approaches a billion and a half tons a year, while the tonnage of the United States alone is over half a billion and growing at such a pace as to be pretty certain of passing the billion mark ten years hence.

THE GREAT IMPORTANCE OF COAL

Whenever there is a stoppage of industries or public utilities by scarcity of coal it is indeed a calamity. Fortunately, there has never been at any time a shortage of coal of such degree as to interfere generally with public utilities, and probably only a failure of food and water would compare with an actual coal famine. In fact, in many localities absence of a coal supply would in itself speedily cause a water famine in view of the constant pumping that is requisite to meet requirements, while the food supply of cities would be exhausted in a few days, for without coal no trains could run, no steamboats ply our lakes and rivers.

With all means of transport devoted to the single matter of keeping the populace alive, and, of course, that would be the first requirement, there would be no transit facilities available for mail service and any journey, however important, would have to be deferred if it could not be performed on foot. All our electric service not derived from water power would soon terminate, we would have no gas and no oil—not even candles—for such an inconvenience as darkness, with all its evil potentialities, would have to be endured while all efforts were made to expedite the carrying of the most necessary articles of food to starving cities. In some places a catastrophe would develop through the absence of power by which to dispose of sewage and indeed the opportunities for misadventure

might be narrated at such length as to tax your patience.

With the development of the business many of the shortcomings of the past have been remedied, and today coal is produced for the most part at mines equipped with mechanical installations representing great fortunes. Without these equipments the tonnage required could not be turned out. And in the transportation and in the retail distribution of tonnage great investments are to be seen at every hand. The trade is becoming a business of large units and the conditions as regard capital investment, the safeguarding of market interests, and so on, are such as to cause it to become a business of relatively few factors. Consolidation is eminently the order of the day. In the anthracite field, in the Pittsburgh territory and elsewhere we have seen mining companies merged into large organizations, and in the retail trade a similar development is in progress.

THE RETAIL TRADE

Originally, it would seem, the retail distribution of coal was taken up as a personal enterprise by a man with a horse and a cart—a business descendant, as one might say, of the old-time carman with his long jacket or leather apron, who distributed wood throughout the Eastern cities. But the circumstances of the times, to narrate which would take more time than I have at command, have operated steadily in favor of the concerns with large facilities and capable equipment. The mere matter of being required to take care of 50-ton steel cars that are becoming the standard railroad vehicle has made demands upon the retail trade which have had a conspicuous effect upon the personnel and the general type of the coal yard in towns and cities.

So while the number of people in the coal trade is probably not increasing, they are all becoming more important business factors, collectively, and as such will make their mark in the community and be more highly regarded than the one-horse operator and the one-horse dealer ever could be. This will redound to the advantage of the trade, for the big business enterprise is pretty sure to command respect when properly managed. And surely there is little to complain of with regard to the management of the coal trade so far as the public welfare is concerned. Far and wide coal has been sold at a price representing a very small margin of profit to anyone engaged therein.

SUBSTITUTES FOR COAL

Having achieved its present position, it is practically certain that coal will continue to grow more important, both with regard to the volume of tonnage and its recognized place in the community. One could scarcely go so far as to say that no substitute for it will be discovered, but certainly there seems to be nothing in view at the present time. Oil is frequently alluded to as a rival fuel possessing great possibilities, but as a matter of fact the whole oil production is not equivalent to more than the annual increase alone in soft-coal requirements. Any changing of large classes of steam users from coal to oil would cause such an increase in the market price of the latter as to quickly eliminate all possibilities of economy save in exceptional cases.

Natural gas has played a large part in certain sections of the country roundabout us, but I need not remind those of you who come from the natural-gas towns what a differ-

ence there is in the gas situation today compared with the situation 20 to 25 years ago. The limitations of the supply are only too evident.

Therefore, as the country develops and modern conveniences and improvements are introduced in one place and another, more steam power becomes necessary and more coal is called for. In fact, it might be said that the possibilities of the trade are such as to give pause to the most heedless. The growth to a billion tons and more which I have referred to as something to be anticipated ten years from now, signifies two billion tons output a little more than 20 years hence, for the growth is at the rate of nearly 10 per cent. a year. Recent progress has accomplished this, notwithstanding the setback following the 1907 financial difficulties, and there is no prospect of this growth being suddenly checked or impeded. Such slowing down in the rate of increase (as distinguished from the absolute increase) will, no doubt, come about gradually.

LOOKING INTO THE FUTURE

There is lots of coal, but so far as regards the accessibility of tonnage convenient to the Eastern and Middle Western states, so far as regards its availability with respect to men to dig it and cars to carry it, the supply is by no means so superabundant as to cause coal to be lightly regarded. In fact, I venture to say that with the demands of the country approaching a billion tons a year, and later two billion tons, the coal man will be looked up to with a great deal of respect and it will be thought that he is accommodating the public in furnishing fuel, for as the years go by the important, all-essential merit of an adequate coal supply will be better recognized than it is today, now that we are scarcely more than emerging from the crude and plentiful era of the industry.

With such facts before us, with a future perhaps better assured than any other trade has, since the control of the industry rests definitely with the comparatively few owners of large coal areas, should we not all consider this a great industry that we are connected with?

I have pointed out to you that the change in railroad equipment has been a factor in improving the individual status of the retail dealer, and with the growth of the trade in general we may expect to see the best minds in our several communities giving attention to the coal trade and having no hesitancy, as they did in past years, with regard to being connected with something once looked upon as a dirty, dusty enterprise of slight importance.

It is well known that some of our greatest capitalists are among the investors in coal properties. Banking interests in all the coal-producing centers have been quick to recognize the prospective value of coal lands. Steadily the business is getting into better, firmer control, and I venture to say that the time is not far distant when practically throughout the year the buyer will have to seek the seller, and surely such a condition will serve to convince us, if we are still reluctant, that coal is an important article, that it is the all-essential element of progress in this age, and that the industry which we represent stands second to none in the affairs of the country. I submit this, gentlemen, to your careful consideration. May these remarks prompt you to stand up all the more strongly for the interests of the trade.

Hand Hammer Drills in Shaft Sinking

SPECIAL CORRESPONDENCE

SYNOPSIS—At Nokomis, Ill., hand hammer drills were employed in sinking two shafts. In soft rock the bits tended to bury themselves. Although it may seem paradoxical, greater speed was made when larger holes were drilled. The saving effected over hand work is also shown.

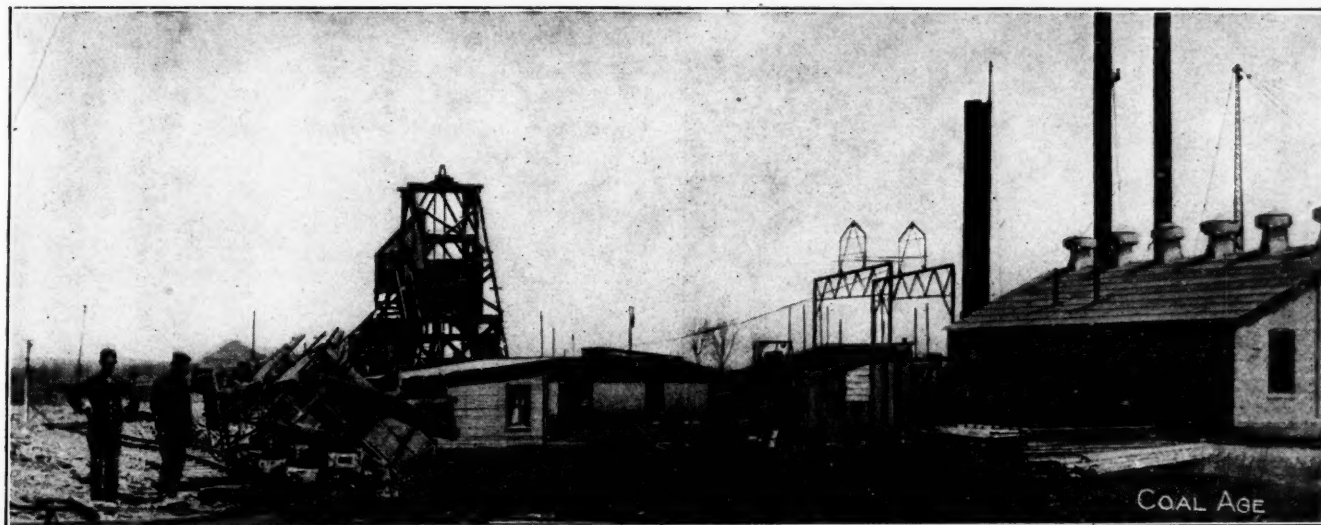
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The Nokomis Coal Co., with headquarters at St. Louis, is opening a new mine on the No. 6 seam, at Nokomis, Ill. At this point the coal is 631 ft. below the surface and is reached by a main hoisting shaft 17 ft. 5 in. by 11 ft. 5 in. inside the timbers, and an air shaft of equal dimensions located 500 ft. distant.

In sinking these shafts, the company employed eight Sullivan air-jet sinkers or hand-feed hammer drills, class DB—19, weighing 40 lb. each, and one Sullivan single-stage, steam-driven air compressor, class WA—3, size 9x10x12 in., providing 174 cu.ft. of free air per min. at a terminal pressure of 100 lb. per sq.in.

It was found that in trying to bore holes in the soft shale with these hammer drills, the tool cut so rapidly as to choke the passage in the bit with muck, stopping the flow of exhaust air and preventing proper cleaning of the drill holes. Hand drilling was temporarily substituted, but on adopting certain recommendations of the manufacturers, the hammer drills worked satisfactorily, and their use was resumed with a marked increase in speed over the hand work.

The change made was in the gage of the bit, which was increased from 2 to 2½ in. on a 3-ft. length, and from 1⅞ to 2¼ in. on a 6-ft. steel. Later on, three steels were employed instead of two, their lengths being 2, 4 and 6 ft., and their gage 2¾ in., 2½ in. and 2¼ in., respectively. It is but natural to suppose that steel of the small gages intended for use in hard rock should travel too fast in soft formations, and in this way give the air insufficient chance to properly clean the drill



POWER HOUSE AND ONE OF THE SHAFTS DURING SINKING

The type of drill above mentioned has a double-grip, push-throttle handle, a cushion valve for reducing vibration, and the exhaust ports are so connected as to permit any desired portion of the expanded air to be discharged through the hollow drill steel to clean the hole of its cuttings. Six-point rose bits were employed.

After passing through the upper capping of hard rock, shale of various degrees of hardness was encountered with an occasional layer of limestone 10 or 12 ft. thick. The rock at times consisted of slaty bands, sandy shale or soft gray material, more like indurated clay than shale.

In sinking through limestone, from 28 to 32 holes constituted a round, the corner holes being bottomed 2 in. outside the line of curbing. As the shafts were timbered throughout, the break lines were 12 ft. 5 in. by 18 ft. 5 in. The holes were 4½ ft. deep and were connected and fired with an electric battery in the ordinary manner. Three 8-hr. shifts were worked, a round being drilled, blasted and mucked out on each shift. Four drillers, four muckers and a shift leader or boss constituted a sinking crew.

hole. The wide gages finally employed gave large openings between the wings of the bit and allowed free escape of air around the steel from the center hole.

The throttle was next fastened open, the air being regulated by the valve on the hose. A device was added for holding the drill steel fast to the tool. These changes enabled the operator to move the drill, bit and all up and down in the hole with the piston running, thus keeping it cleaner and preventing the exhaust-air passage in the steel from clogging with muck, so that the tendency to bury the bit was diminished.

The holes were kept full of water to assist the action of the exhaust air from the drill bit in keeping the cuttings stirred up. The exhaust opening at the top of the cylinder was also plugged, thus enabling the entire exhaust to be discharged through the steel when desired.

These changes gave the following results in soft shale, as compared with hand drilling. Hand drillers using 2¼-in. steel worked at the rate of 4½ ft. per man per hour, or four men put in a round of 54 ft. in 3 hr. With the air drill, four men drilled 18.9 ft. per man per hour,

or a round of 54 ft. in about 45 min., thus accomplishing a saving of 2 hr. and 15 min. per 54-ft. round.

Owing to the variation in the time required for shooting and mucking, this increase in drilling speed meant an increase in depth per day of 1 ft., or $4\frac{1}{2}$ ft. per 24 hr., as compared with $3\frac{1}{2}$ ft. per 24 hr., with hand drills.

Sinkers, including drillers and muckers, were paid \$3.39 per 8-hr. shift, the shift leader receiving \$4, mak-

collar, exerting a spring grip upon it and holding it firmly.

On the upper end of this retaining spring are forged trunnions, which are held in place on the side rod by spiral springs, which exert a constant pressure upon them. When changing steels, it is merely necessary to bear down on the retaining spring, where it half circles the steel, until the collar on the steel can slide past this spring. The spring will snap back into position when released because of the tension on the side-rod spring and the action of the trunnions. The device may be easily removed from the drill by taking out the transverse bolt.

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Anthracite both Prepared and Mined

The ignorance of retail coal dealers of the details of the production of anthracite coal has been a subject of comment among the operators since several of the large companies entertained the retailers at the mines in northeastern Pennsylvania recently. The lack of knowledge which the operators chiefly deprecate is in regard to the preparation processes after the coal has been mined.

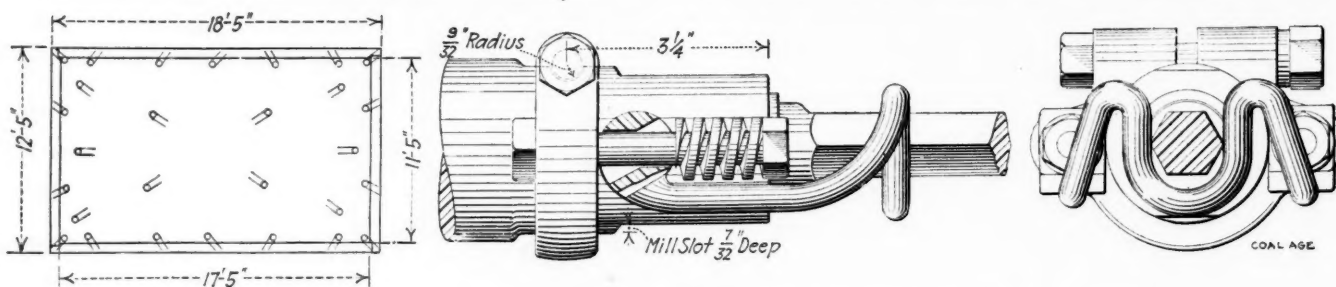
"It is hard enough to have the general public think that we merely dig the coal out of the ground and sell it at an enormous profit," said one of the operators, "but when we find some of the men who are the intermediaries between us and the general public cherishing the same delusions it is most discouraging. Of course, there is a certain number of them who are well informed.

"Some of them seem to think, however, that we just back up a wagon to a hole in the ground and haul the coal away. Few of them realize that this is a manufacturing as well as a mining proposition, and that 20 per cent. of the cost of mining and preparing the coal is incurred above ground.

"The big breakers in which the coal is prepared cost on an average \$200,000 each. In recent years two concrete breakers have been built, each of which cost approximately \$300,000. The preparation of anthracite consists primarily of sizing it into the various grades fur-



A NEARER VIEW OF THE TEMPORARY HEADFRAME



THE BIT-HOLDING DEVICE AND DIAGRAM, SHOWING LOCATION OF HOLES IN SHAFT

ing a total labor cost per day of roughly \$93, or \$26.50 per foot by hand drilling. The saving by using the hammer drills, therefore, amounted to one foot in each shaft; or \$53 per 24 hr. for both shafts.

The device for holding the hollow drill steel in the chuck of the hammer drill, as described above, was a home-made affair. A more satisfactory and permanent device has just been worked out by the makers of the drills, as shown in the accompanying sketches. This consists of a yoke and side rod fastened by means of a clamp on the nose of the tool. A retaining spring is arranged to pass half around the drill steel just below the

nished to the retailer and eliminating the slate and rock.

"The sizing of coal first requires a breaking down of the large lumps by rolls which are equipped with teeth so arranged as to crush the fuel with the production of the least amount of small sizes. Another delusion cherished by the retail dealer is that we can break all of the coal into any size we please. This is not true. The best machinery we have been able to devise produces a large proportion of the small and unprofitable sizes.

"The contents of a car of coal as produced in a mine with heavy pitching breasts consists of everything from dirt to lumps of slate and rock weighing as much as

500 lb. Under the best conditions of mining there is always a percentage of foreign substances. These must be eliminated by the big shakers and by hand picking. After that the coal must pass over screens, down spiral separators and through a water jig before it is ready for loading. The cars are loaded by special machinery, and are carefully inspected before they are allowed to leave the breaker yards.

"In addition to all this, vast quantities of coal of the sizes not marketable during the summer must be stored in order to keep the mines in operation during the dull season. The storage yards range in capacity from a hundred thousand to a million tons. All of this is tremendously expensive, and if the retail operators would only realize that the production is physically limited to from five and a half to six million tons a month, and that it is utterly impossible for us to supply them with all the sizes they want when and in what quantities they order them, it would do much to simplify our relations."

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Farmers' Right vs. Coal Operators' Right in Cherokee County, Kan.

The suit of a farmer vs. a coal operator in Cherokee County, Kan., was recently decided in the Federal Court of Kansas City, and the decision which directly affects 160 acres of land and indirectly more than a million dollars' worth of real estate was decided against the operator.

The suit was an injunction brought by the J. R. Crowe Coal & Mining Co. against William P. Daugherty owner of the 160 acre tract, and his agent William Humble.

Several years ago the St. Louis & San Francisco R.R. sold Daugherty the land, retaining the mineral rights. Recently the railroad leased the coal to the Crowe Co. and this spring the latter started to move a steam shovel onto the land with the intention of mining the coal by the stripping process. Due to the shallowness of the coal measure, this is the only means by which the coal may be secured.

Daugherty objected so strenuously to having his farm ruined that the coal company finally had recourse to an injunction suit. Judge Pollock, before whom the suit was brought, appointed J. S. Dean, of Topeka, Special Master in Chancery, to hear the testimony, report and recommend judgment. His decision was to the effect that the coal company had no right to mine by the stripping process to the detriment of the land.

Fifteen hundred acres of coal land becomes involved by this ruling. Under this area the coal bed cannot be mined by the ordinary process and the operators must turn to stripping. This is a method of which the farmers did not know when the land was leased to the operators, and many of them have been compelled to stand by and see the shovels tear huge furrows across their level acres.

It is now believed that all men who leased their land with the idea that the coal would be mined by the old method, will endeavor to protect themselves. However, since it is believed that the land, after it has been stripped, is much more valuable agriculturally than before, the most stringent action which many farmers will take, will be to require the operators to level down the ground after the coal has been removed.

Pennsylvania Smashes Coke Record

Pennsylvania stands pre-eminent among the states in the production and manufacture of coke. According to the figures of E. W. Parker of the U. S. Geological Survey the quantity of coke produced in the state in 1912 was 27,372,018 short tons valued at \$56,054,478. In 1911 the production was 21,923,935 tons valued at \$43,053,367. The increase in 1912 was therefore 5,248,083 short tons or 24.85 per cent. in quantity and \$13,001,011 or 30.2 per cent. in value. The quantity produced in 1912 was the largest on record, exceeding the previous maximum of 26,513,214 tons in 1911 by 858,804 short tons, but falling behind the earlier year in value by \$11,583,546.

As a producer of coke Pennsylvania is relatively of greater importance than as a producer of coal. Including the production of anthracite Pennsylvania contributes less than one-half of the entire output of coal in the United States, while nearly two-thirds of the total production of coke comes from within her boundaries. The state has, however, not progressed as rapidly as some others in the matter of conserving the byproducts of coke making. All but a very small quantity of the state's coke is made in beehive ovens or in those of rectangular sections without the recovery of any byproducts or the utilization of the heat generated in the coking process.

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Increased Coke Production in Alabama

Alabama's output of coke in 1912 amounted to 2,975,489 short tons valued at \$8,098,412 against 2,761,621 short tons valued at \$7,593,594 in 1911. According to E. W. Parker of the U. S. Geological Survey, the increase in 1912 was 213,968 tons and \$504,818 in value.

Alabama retained second place in the rank of coke-producing states in 1912, having superseded West Virginia in 1911. The average price per ton for Alabama coke has declined from \$2.82 in 1910, to \$2.75 in 1911, and \$2.72 in 1912. This does not necessarily indicate an actual decline in the price of coke. A large proportion probably over 90 per cent. of Alabama coke is consumed in furnaces which are owned by the same interests owning and operating the coal mines and coke ovens, and the placing of a value on the coke is largely a matter of accounting. The value per ton of the coke produced in 1912 was lower in spite of the fact that the value of the coal used advanced from \$1.28 in 1911, to \$1.35 in 1912.

That this state has developed her coking industry along the lines of modern practice is evidenced by the fact that in each of the last three years the only new ovens under construction were those of the retort variety. Moreover during 1912, there were 191 beehive ovens abandoned.

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Petroleum Production in 1912

According to the U. S. Geological Survey the great production of petroleum in 1911, which was 220,449,391 barrels, was surpassed in 1912, when the total reached 222,538,604 barrels. Higher prices were the rule in 1912, except in California, and even in that state there was no material decline. The total value increased markedly, reaching \$164,087,342, or 22.41 per cent. above the value of 1911.

POWER DEPARTMENT

A Large English Air Compressor

SPECIAL CORRESPONDENCE

SYNOPSIS—*The essential points of efficient air compression with particular reference to the type and placing of valves is first discussed. A new kind of valve is then described as is also a large-capacity machine in which they are employed.*

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Although the use of electric power has been a serious competitor with compressed air in colliery work during the last few years, there is a feeling, which has a strong foundation in fact, that in some of the more gaseous mines at any rate, electric power is not as suitable for the work required as compressed air. The endeavors of compressor

when the pressure in the receiver has been reached in the compression cylinder. These valves should also have sufficient width of seating to insure their being kept tight, so that there be no loss by leakage back into the cylinder; they should be self-adjusting under all speeds and pressures. The piston should be easily accessible for examination and renewal, and wear and tear should be minimized as much as possible.

The key to the situation appears to be in the kind of valve used, inasmuch as leakage during both intake and discharge depends on their design and efficiency. The clearance space is governed by the type and position of the valves and air passages, while excess pressure in both suction and expulsion is directly attributable to their area and durability.

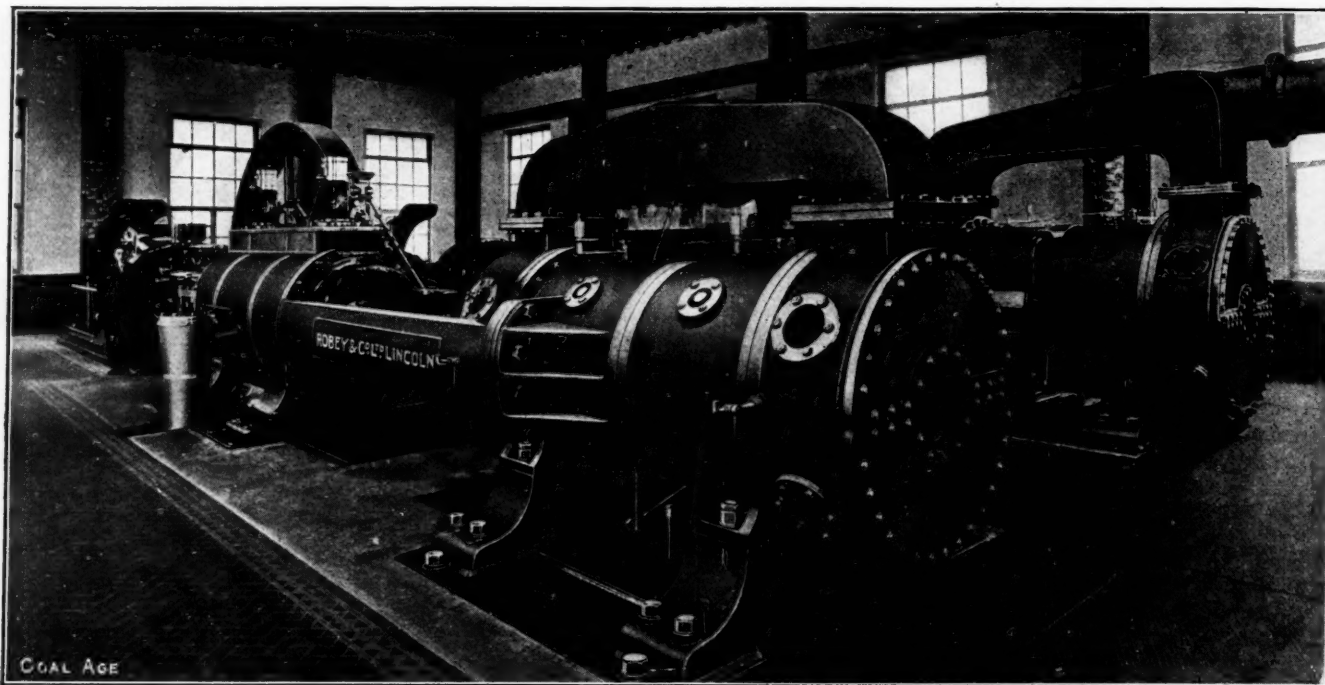


FIG. 1. A 6300-CU.FT. AIR COMPRESSOR, USING NEW TYPE OF VALVE

manufacturers have, therefore, been directed toward the production of machinery which would give the maximum economy in operation.

THE REQUISITES OF A GOOD COMPRESSOR

As regards the compressor itself, the conditions which have to be fulfilled are that on the suction stroke the cylinder should be filled with air at atmospheric pressure throughout the entire piston travel. When the compression stroke is made there should be no loss of any portion of the air previously drawn in either by return to the atmosphere or by leakage, but the whole contents of the cylinder, with as little deduction for clearance space as possible, should be discharged through the outlet valves.

Moreover, in a good compressor, the outlet valves should have large discharge area and should open automatically

Examining the valve systems which are adopted in air compressors as made today, it will be seen that these systems fall into series or groups. In the first, poppet valves are used, both on the inlet and discharge. In another group may be classed compressors having large flat hinged valves in the cylinder covers, actuated similarly to poppet valves. Yet another type of compressor has mechanically operated inlet and discharge valves, which open and close by means of direct mechanical connections. Still another modification adopts inlet valves mechanically operated and poppet discharge valves.

The remaining groups consist of compressors using direct air controlled and balanced inlet and discharge valves, which lend themselves to increased piston speed and efficiency, but are somewhat expensive in first cost and have to be maintained in a careful manner; and compressors

using light disk valves with a small lift. This latter appears to be the latest word in compressor design, and it may therefore be well to briefly refer to details.

An interesting type of this valve is shown in Figs. 2 and 3, the former showing an automatic disk valve in its assembled condition as made by Messrs. Robey & Co., Ltd., of Lincoln, Great Britain, the latter showing the valve disk itself. The inlet and outlet valves and their seats are complete in themselves and are secured to the cylinder by means of three lugs. The seating is a metallic contact joint and can thus be made and broken many times without damage. The valves are multi-ported, thus requiring only a small lift. They are therefore silent in action and practically free from wear.

As seen in Fig. 3, the valve disks themselves are corrugated, and, being made from special mild steel they are extremely strong and elastic. They are held in position by coiled springs of square section, fitting into the flanges on the outside and inside edges of the valve, the springs being held at the other end by the guide plate. Hence the valve is pressed firmly into position on its seating, but can move in all directions without the use of guide studs or other supports. It is thus free to seat itself accurately and noiselessly at each stroke, lubrication being rendered unnecessary.

AN ILLUSTRATION OF APPLICATION

These valves are now being adopted in connection with the Robey horizontal, two-stage air compressors which are coming into considerable use in colliery work. A typical

The steam drop valve employed on this machine represents the highest class of gear that can be applied to steam cylinders, especially when high pressures and superheating are adopted. The gear is actuated from a lay-shaft driven by skew gears from the main crank shaft. The eccentrics operating the admission and exhaust valves are small, as the work they have to do is light.

Both the admission and the exhaust valves are in equilibrium and as soon as the admission of the steam has been carried far enough to do the work required, the admission valve is immediately closed. The governor, when rising, actuates two cams, which regulate the length of time in which the trippers are in contact.

This gear, controlled by the governor in combination with the automatic air-pressure regulator, insures that the supply of air is kept constant without waste and without attention on the part of the driver.

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The Ball Bearing on Locomotive Armatures

From their use in bicycles and automobiles there are but few people who do know something at least of ball bearings and their application. But compared with the present-day development of this device the bicycle bearing of one or two decades ago was an extremely crude and inefficient affair.

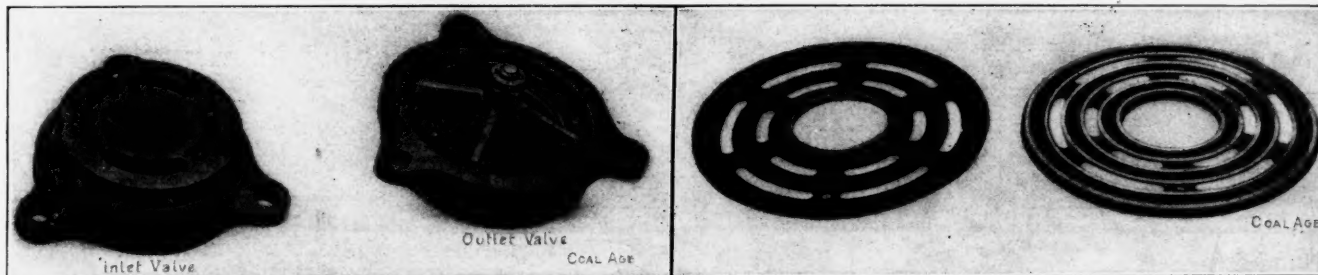


FIG. 2. ASSEMBLED VALVE

FIG. 3. STEEL VALVE DISK

installation is shown in Fig. 1, it being the compressor supplied to the Altofts collieries of Messrs. Pope & Pearson, Ltd., of Normantown. This compressor is capable of handling 6300 cu.ft. of free air per min. when running at 56 revolutions under a boiler pressure of 120 lb. per sq.in. The high- and low-pressure steam cylinders are 27 in. and 46 in. in diameter, respectively. The corresponding air cylinders are 30 in. and 46 in. in diameter. The piston rods are 5 in. in diameter and the stroke is 60 in. The machine is provided with a flywheel of 16 ft. diameter. Between the two air cylinders is placed an intercooler. The cylinders themselves are water-jacketed and fitted with an improved type of piston, which provides for the use of the whole of the depth of the piston body and rings for bearing surfaces.

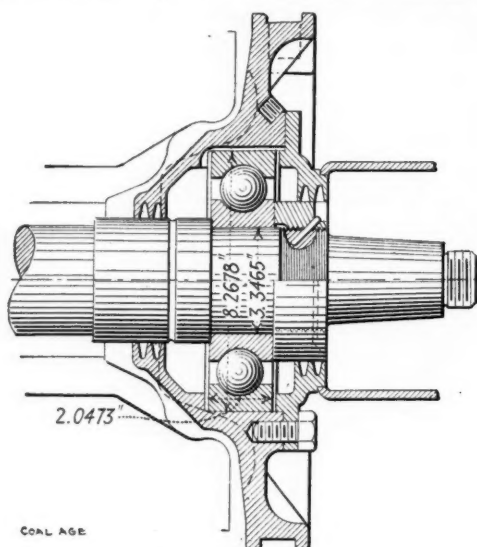
The control of the engine, while being dependent on the ordinary centrifugal governor, is also carried out by means of the air itself. Should the pressure in the receiver fall, the air governor lengthens the cutoff of the steam valves while if pressure rises it shortens it. The speed of the engine varies therefore with the amount of air required, and the pressure in the receiver is maintained within very fine limits.

The general impression regarding this type of journal is that its use is justifiable only where a great reduction in friction is necessary or desirable. This may or may not be the case. Other considerations and characteristics may enter into the selection of a ball bearing which are vastly more important than a lessening of resistance to rotation.

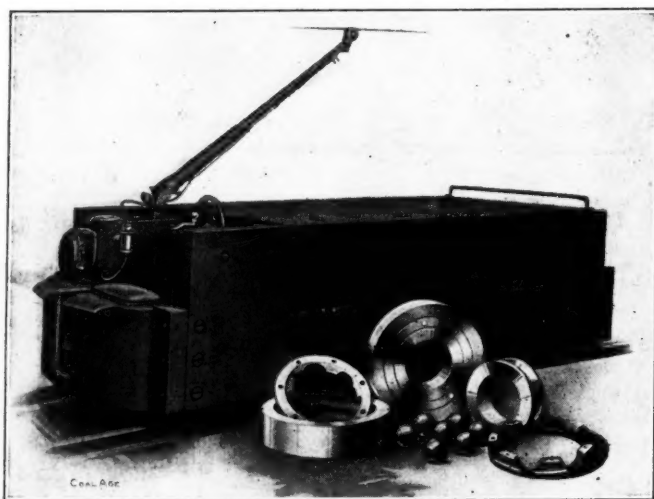
It has been now about five years since the Jeffrey Mfg. Co., of Columbus, Ohio, placed the first ball bearing upon the armature shaft of one of their electric mining locomotives. So satisfactory were the results obtained, not so much because of any reduction in friction as from the standpoint of durability that at the present time ball bearings are the standard journal for all armature shafts upon this company's mine motors. Other manufacturers of this class of machinery also are rapidly adopting this means of armature-shaft support.

There are two principal advantages gained in the use of this type of bearing upon armature shafts. First the wear and consequent lowering of the armature toward the pole pieces is practically a negligible quantity. The armature is consequently at all times subjected to a uniform action from the field.

The second advantage is perhaps less immediately apparent, although it depends upon exactly the same cause. The armature pinion and gear with which it meshes are carefully machined. Their efficiency in power transmission therefore largely depends upon the accuracy with which they mesh. If a bearing wears rapidly this allows these gears to spread apart and their center lines to recede, allowing excessive backlash, which causes the gear teeth to wear rapidly at or near the point giving rise to the grinding sound so well known by those familiar with this type of machinery. This improper meshing soon cuts



CROSS-SECTION OF PINION BEARING OF
ARMATURE SHAFT



MINE LOCOMOTIVE AND ENLARGED VIEW OF ARMATURE
BEARING

out the pinion and renders frequent renewals necessary. The ball bearing removes the cause of this trouble.

The Hess-Bright Mfg. Co., of Berlin and Philadelphia, have perhaps done more toward the commercial development of the ball bearing in this country than any other one firm. In the construction of their bearings a high-grade composition steel is used for both balls and races. This material requires a heat treatment exactly similar to the "silver steel" so well known in this country and employed in the manufacture of edge tools for cutting both wood and metal. The hardness and toughness of this steel in the finished state is well shown on

crushing test. When three 1-in. balls are placed one above the other between the stationary and moving heads of a Riehle testing machine they withstand between 65,000 lb. and 70,000 lb. before failure. Furthermore, when finally split by this enormous stress the fracture shows an extremely fine, silky texture such as may be seen in the best of steel springs or edge tools. This size of ball is that ordinarily employed on the pinion end of a 15-hp. motor armature where the bearing is subjected to a maximum working load of 1400 lb. It will thus be seen that the factor of safety is extremely high.

It is probable that this high factor of safety has had much to do with the good results obtained with these bearings when given even reasonable care. An operating company in the bituminous region of Pennsylvania some years ago purchased some very heavy locomotives equipped with plain or ordinary bearings. In the first year's operation this firm spent \$760 in repairs to two machines, all of which was directly traceable to armature-bearing wear or failure. Ball bearings were then substituted for the plain ones with the result that in the ensuing year not one cent was expended for armature repairs.

The use of ball bearings in heavy industrial machinery although demonstrated practical is as yet relatively only in its infancy. Nor is it strange that among engineers, mechanics and locomotive drivers generally there may be found many skeptics and men "from Missouri." In the face of such an experience as that given above—which has been related because it was typical—there is but one conclusion that may be drawn.

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The Steam Turbine in Mine Pumping

The peculiar adaptation of a well designed steam turbine to mine pumping is worthy of careful consideration. The essential characteristics of a mine pump are, simplicity in construction and operation; durability of all working parts; and compactness and efficiency.

The centrifugal pump, unquestionably, combines some of these features to a remarkable degree. It is compact in size and when well designed is simple in construction and durable. It possesses the marked advantage of continuous action, in contrast with the reciprocating motion of pumps of the piston or plunger type. The construction of the centrifugal pump admits of its being directly connected with an electric motor or steam turbine, which feature alone insures no loss of power between the motor and the pump. The continuous action of the pump eliminates the question of water-hammer.

The turbine, also, possesses features that recommend it particularly to mining use. It requires less steam than a direct-acting reciprocating pump of equal power. It possesses an advantage over the electric motor, in being free from injury by dampness. This is an important feature in mine work. The statement is made that a low-pressure turbine-driven centrifugal pump can frequently be installed in conjunction with suitable condensing apparatus to operate on the exhaust steam of the power plant, which would mean a saving in power.

In the selection of a steam turbine or a centrifugal pump, for mine work, it is extremely important to give due regard to the detailed construction of each machine as being such that the working parts are easily accessible and that all parts subject to wear or corrosion are readily replaceable.

EDITORIALS

What about Ohio?

During the past year, developments in Ohio, in respect to state government, have assumed some proportions. Things have been doing that keep one guessing as to their ultimate outcome. That the pronounced changes growing out of recent enactments by the legislature are in the nature of an experiment, none can doubt, and the result will be watched with interest.

Probably the most important and far reaching in effect, of the many bills before the last legislature, is Senate Bill No. 137, passed Mar. 12, and approved by Gov. James M. Cox, Mar. 18, 1913. This is a bill creating the Industrial Commission of Ohio, superseding the State Liability Board of Awards, abolishing the departments of Commissioner of Labor Statistics, Chief Inspector of Mines, Chief Inspector of Work Shops and Factories, Chief Examiner of Steam Engineers, Board of Boiler Rules, and State Board of Arbitration and Conciliation; and merging certain powers and duties of said departments in and transferring such powers and duties to the said Industrial Commission of Ohio. Besides granting the commission certain other powers, the bill has repealed 38 sections of the General Code and modified seven other sections.

The enactment provides that the Industrial Commission of Ohio shall be composed of three members, to be appointed by the governor within thirty days after the act goes into effect. The first appointment under the act, will be one commissioner for two years, one for four years and one for six years; and, thereafter, one member of the commission will be appointed biennially, for a term of six years. Not more than one of the persons so appointed can, by previous vocation, employment, or affiliation, be classed as a representative of employers; and not more than one, a representative of employees; and not more than two of the members of the commission shall belong to the same political party.

This act of the Ohio legislature goes into effect Sept. 1, 1913. In accordance with its provisions, Gov. Cox has appointed the following named persons to constitute the commission: Wallace D. Yaple, Chillicothe; Thomas J. Duffy, East Liverpool; and Prof. M. B. Hammond, Ohio State University, Columbus.

The act provides for the removal by the governor of any member of the commission for inefficiency, neglect of duty, malfeasance, misfeasance, or nonfeasance, in office. No commissioner shall hold any position of trust or profit, or engage in any occupation or business interfering or inconsistent with his duties as commissioner, or serve on any committee of a political party. The commissioners are to receive each an annual salary of \$5000, subscribe to the usual constitutional oath of office, and give a \$10,000 bond, approved by the governor.

It is further provided that, within thirty days after the act goes into effect, the commission shall meet at the seat of government and organize by choosing one of its members as chairman; the majority of the commis-

sion to constitute a quorum to transact business, and no vacancy to impair the right of the remaining commissioners to exercise all the powers of the commission.

The scope of the commission is shown by the following:

Sec. 11. On and after the first day of September, 1913, the following departments of the state of Ohio, to wit: Commissioner of Labor Statistics, Chief Inspector of Mines, Chief Inspector of Work Shops and Factories, Chief Examiner of Steam Engineers, Board of Boiler Rules, and the State Board of Arbitration and Conciliation shall have no further legal existence; except that the heads of said departments and said boards shall, in ten days after the said date, submit to the governor their report of their respective departments, for the portion of the year 1913 during which they were in existence; and, on and after the first day of September, 1913, the Industrial Commission of Ohio shall have all the powers and enter upon the performance of all the duties conferred by law upon the said departments.

Sec. 12. The Industrial Commission shall supersede and perform all of the duties of the State Liability Board of Awards, . . . etc.

The State Liability Board of Awards was provided by Act of General Assembly, May 31, 1911, to administer the state insurance fund for the benefit of injured workers and the dependent survivors of those killed in the performance of their duties, in industrial operations.

In connection with the practical working of the new law creating the Industrial Commission of Ohio referred to above, several grave questions present themselves that the future alone will determine. The wisdom of committing so large a portion of public trusts and interests to the charge of three individuals is yet to be proven. While such a concentration of power will undoubtedly be beneficial in a supervisory sense, there would be *positive danger* in the abolishment of the offices of the heads of the several state departments whose responsibilities demand an intimate knowledge and acquaintance with the work of the department. We understand that, for the most part, these departmental heads or chiefs, though deprived of their titles, will be retained in charge of their respective divisions.

In the opinion of COAL AGE, good results can only be obtained, in mine inspection, by organization of an efficient corps of inspectors under a Department Chief, who in turn is held accountable to the governor or a supervising commission. We do *not* believe any commission of three members, whatever their intelligence, can assume to personally direct the work of the numerous state departments.

Another question that presents itself is in reference to the legality of this act of the legislature by which it presumes to summarily terminate a state office, though only appointive, during the term of its incumbent.

There is grave doubt of the legality of any enactment of legislature that curtails or limits the will and voice of the people. On this account, we may seriously question the legislative right to abolish, by enactment, any *elective* office, during the incumbency of a regularly elected officer. In respect to an *appointive* office, as in the Ohio cases, however, the illegality of such enactment is not as clear, but is debatable. The office of chief mine inspector is an *appointive* office.

The legislature is an instrument of the people and, as such, is subordinate to the will of the people. The creature is never greater than its creator. Many will question if the *appointments* of an officer elected on a certain platform, are not as much the expression of the will of the people as the officer elected. This is an open question.

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That Mysterious Physician

The remarks of the physician which recently appeared in our columns regarding the American Mine Safety Association, have created some little unfavorable comment. It has been thought by some that it is inexcusable that *anyone*, without making his name public, should criticize, an association having such a laudable purpose, but we cannot feel that he is unentitled to his incognito.

The "physician" attacked specifically the constitution of the advisory or executive committee on first-aid methods on which the duty of accepting or rejecting new dressings, which may be offered in any field contest, is imposed. This committee was to contain two first-aid men, two operators, two physicians and one representative of the Bureau of Mines.

In the end, this body was not formed according to the recommendations of the committee on first-aid methods, it being left to the executive committee proper to make its own selection. But we are obliged to take up the cudgels for this unnamed physician and defend him against the suggestion of Dr. Rountree, who characterizes him as "a person ignorant of the facts or else intentionally misrepresenting them." The unknown author of the article depended on COAL AGE for his information and this journal was misled into publishing the statement as it was furnished by the American Mine Safety Association, several days after the meeting closed. In future, we shall be more careful and not rely so confidently on uncertain sources for fear the parent may fail to recognize its own child.

Even Dr. Knoefel, the chairman of the original committee on first-aid methods carefully avoids admitting that his committee introduced resolution 27, which proposed to put laymen on the board appointed to discuss first-aid methods. He fails to state that he rose to object to the submission of this specific resolution to the action of the main executive board, though it must be conceded that his reasons for the objection did not arise from his desire to confer on this subject with the said laymen.

It appears in a later publication that the association did not approve the resolution though the report of the meeting as it reached us overlooked this fact and mentioned only that it was *presented*, naturally leading our "ignorant" friend into a misapprehension. From Dr. Rountree we learn that about two dozen physicians were afterward appointed; 13 more, it is to be noted, than were to be found at the Pittsburgh meeting, in which the medical profession was inadequately represented, the inadequacy being rather in numbers, however, than in quality of representation. The author of that much debated article, "The First-Aid Muddle," probably does not even now know that criticisms, such as his, were admitted to be so valid that the committee was entirely rebuilt. How could he learn that fact without being a member of the Committee of Seven, which contains ten members? Though but seven were mentioned in the report of the

meeting forwarded to this paper, we see now there is really a decemvirate in control of its destinies. A belated bulletin has cleared up this difficulty among many others.

Whatever was the constitution of the final advisory committee, the fact remains that the first body on first-aid methods did contain several laymen: E. B. Sutton, W. A. Raudenbusch, W. D. Roberts, Atherton Bowen and J. E. McDonald. We do not think that the committee was the weaker for these lay members, but a physician might feel that such men should be excluded and surely he is permitted to say so without giving his name.

The physician judged the committee incompetent because it ordered that the Sylvester methods were to be approved in all cases, unless an injury made their use inadvisable. Trained physicians and physiologists know that the "tidal" air passing in and out of the lungs is greater when the Schaefer method is employed than when the Sylvester treatment is practiced and they believe there are six or seven other arguments against that method of operation, and, as the unnamed physician states in his article, an important body of surgeons and physicians has given the Schaefer method preference.

The critic also judged the reliability of the association by its rating of demerits. We, ourselves, cannot understand how aseptic treatment can be so important as the members at that meeting appeared to deem it, and we know physicians who agree with that view. The hands of the first-aid man in the mines are sterilized with acids and alkalis and at worst they are not likely to be more harmful than the dirt ground into the wound. The air itself is sterilized by mine gases, falling moisture and cooling and tetanus almost never sets in as a result of mine injuries.

Grossly septic treatment is not likely to occur at the hands of trained men. We hardly believe that the first-aid man at a meet will remove a tobacco quid from his jaws and revert to the barbarisms of the past. But if a helper should pass a hand, supposedly sterilized by mine acids, over the face of a bandage, we agree with the "physician" he has not done the patient five times as much harm, as another man who, by wrongful methods of respiration, has permitted a victim to perish under his charge. Because he has pointed out this folly, the unknown "physician" has been the butt of criticism which seems to us by no means fair. Almost any part of first aid can be done so badly as to entitle the team which is guilty of it to 10 demerits or even total disqualification.

The Bureau of Mines and H. M. Wilson are to be commended for the forming of the association. It cannot at once attain to the position in which it will ultimately stand, but we think that if it is not querulous under criticism, it will grow in strength and in numbers. If at its start it may have put the cachet of its approval on the wrong treatment, if it has made the judgment of a few appear as the counsel of the many, if it has unsettled some minds which argued that first aid was a shallow study on which at best 200 pages could be written, no one should be discouraged.

The American Mine Safety Association is experiencing the trials of the beginner. The student who finds he has been wrong, that there are several mathematical solutions of the same problem, that quadratics do not end algebra, soon plucks up spirit to go ahead with a study which is only the more valuable because it requires judgment, plodding and continued effort.

SOCIOLOGICAL DEPARTMENT

The American Mine Safety Association

BY AUGUST F. KNOEFEL*

The May 17 issue of COAL AGE contained an article entitled the "First Aid Muddle" from a "Physician." When I read these remarks my first thought was to reply but I was deterred from so doing by the fact that the "physician" was not honorable enough to sign his name to his remarks, but after reflecting upon the matter and realizing that COAL AGE holds a prominent place in the mining industry and that whatever it presents to its readers is received by them as the fact, I would like to make the following statements.

NEED FOR FIRST-AID STANDARDS

The American Mine Safety Association had its inception in the crying need for standardization of first-aid methods. The Bureau of Mines, being better acquainted with this need than any other organization or individual, called together last September those who were directly interested. At this meeting plans were laid to bring together officially all those who knew anything about or who practiced first aid and mine rescue. This being the first meeting, all plans and suggestions were tentative until standards could be evolved.

It is rather surprising that a physician would permit himself to be the author of the remarks made in your issue of May 17. Medicine is centuries old, has always been the subject of criticism and always will be. With all the investigations and researches, the treatment of typhoid fever is as variable as the winds. One can go to one hundred doctors and find each treating typhoid differently. If a student would collect the remedies recommended for that disease in the standard textbooks of medicine, he would have an apothecary shop on his hands.

I feel that I am perfectly safe in the assertion that it will not take the American Mine Safety Association nearly as long by several hundred years to standardize first aid. The St. John's Ambulance Corps was not established in a year or its methods evolved at one meeting of two days' duration.

SURGEONS DO NOT PRACTICE FIRST AID

As to the need of the advice of leading surgeons, it may be replied that there are but few surgeons with all hospital facilities at hand who could apply a triangular bandage neatly and properly. The practical suggestions will come from those whose daily occupation is at the mine and at the scene of the accident. The purpose of first aid is not to make a surgeon or a hospital attendant out of the coal miner, but to teach him what are suitable, efficient and safe dressings and to instruct him as to what he should not do.

The matter of standardizing first-aid methods and dressings was not referred to the committee mentioned

but to one made up of surgeons, these being men who are not only acquainted with the work but also practice it. This is the class of experts who will receive and pass upon all suggestions. To do this intelligently will take time because all proper investigations will have to be made and evidence produced as to the worthiness and efficiency of the methods adopted. Nothing will be rejected which will promote the ends sought, and anything adopted must be simple, yet efficient.

BACTERIA OF THE MOUTH

As to remarks upon asepsis, the writer evidently has overlooked that there are numerous forms of infection, and because you have one form of bacteria present there is no reasonable excuse for adding another of a different type. It is a common procedure among miners to use a quid of tobacco upon a wound. Within the last month I attended a miner who adopted the above treatment upon a laceration of the leg with the result that he had an infection from bacteria such as inhabit the mouth and was incapacitated five times longer than if he had not adopted this treatment. It is such instances as these which lead the instructors to impress on their students the need of asepsis.

The value of the Schaefer method of resuscitation will receive from the committee appointed the consideration it deserves. All the association asks is the assistance of all parties interested, and I trust that those who differ from its views will make them known in an honorable manner. Furthermore, if they are vitally interested as I believe the writer of the article on "The First Aid Muddle" is, let them attend the next meeting in September and add their opinions to ours.

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Occupational Schools

The annual report from the Lost Creek school of the Lehigh Valley Coal Co. shows that the school held 140 sessions between Sept. 9, 1912, and June 10, 1913, and the number of students increased during this time from 72 to 113. Since the school opened 191 students have been enrolled. This year an average attendance of 29 was maintained. Twelve of those instructed were not in the employ of the Lehigh Valley Coal Co., and seven were not engaged by any of the mining corporations. Since the beginning of the school in 1910 two students have been granted mine foremen's certificates and fifteen have qualified for assistant mine foremen. The number of students who have partly completed courses is 153, and 102 final certificates have been granted.

There were 143 sessions of the Centralla school, and the number of students increased from 143 to 209. Eighteen of the students were in the employ of other coal companies, and twelve were not employed by any coal corporation. The average attendance this year was 35. Since the opening of the school in 1910 twelve students have been granted mine foremen's certificates and sixteen have received papers qualifying them to act as assistant mine foremen. The number of students who have partly completed their various courses is 74, and 32 final certificates have been granted.

The Michael Lavelle Burke Gold Medal for the student of the graduating class at Lost Creek who attains the highest proficiency in his studies was won this year by Patrick J. Kelly. This solid gold medal is given by the E. J. Burke Co. in commemoration of the son of Edward Burke, a former employee of the company. Edward Burke is well known as one of the pioneer miners of the Packer collieries.

*Member of the Executive Committee, American Mine Safety Association; mine physician, Vandalia Coal Co., Linton, Ind.

The Commissary: Its Indispensability and Purposes

By B. F. RODEN*

SYNOPSIS—*The commissary serves the lawful interests of both operator and employee and should not be discontinued. It should not, however, be used as the main source of profit while coal is sold at less than actual cost.*

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The commissary is a legitimate department of the mining business, a species of byproduct in the process of mining. A mining company has a right to enter into the business of selling necessities and luxuries to the population assembled and maintained as a result of its industrial developments. There is no reason why these profits should be turned over to outside parties; but it is quite essential that the store operated by the employer should be properly conducted. A high standard of quality should be maintained.

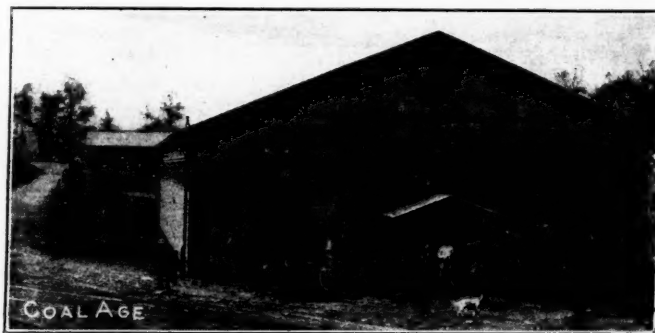
DISHONEST MERCHANDISE

Canned goods may be purchased which have been packed with water at a lower price than is asked for a standard quality of goods with the proper proportion of solids to the can. A 3-lb. can of tomatoes does not always contain an equal amount of the vegetable. Sirup is supposed to consist of cane sugar and molasses, but a cheaper article may be sold composed of a mixture of

belief that it is securing first quality or goods at cut prices. While this dishonesty is common in the open market the commissaries are usually above such tricks.

ALL THE PUBLIC WILL STAND

Commissary customers should receive full weight and good value, and every sale should be made at a reasonable profit above the cost of handling. Reasonable profit is a flexible term and depends on the disposition of the man using it. But the limit is certainly not to be placed as high as "all that the customer will stand." Miners, like operators, do not feel well disposed when they find they have paid a price for merchandise higher than they would have been charged for the same article elsewhere.



THE RODEN STORE HAS NO SHOW WINDOWS

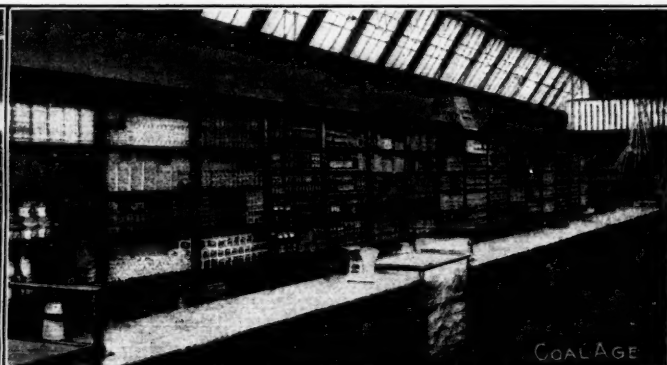


DRY GOODS DEPARTMENT

the latter with glucose. Pickles and other canned goods may be packed with preservatives which are injurious to health, and vinegar may be manufactured with a barrel, a hose and some acid, but commissaries should not handle such goods.

The Alabama law specifies that all food stuffs sacked in the state shall be of full weight, but the same merchandise can be purchased across the state line packed in 70- or 80-lb. sacks, and they can be sold as containing 100 lb., if the merchant sells by the sack and makes no statement as to the weight which a sack is supposed to contain. Off-grade, damaged or remanufactured goods such as redyed ribbons can be sold as first-grade merchandise. Second-grade cloth can be palmed off as first. Poor thread, and shoes with parts of cardboard instead of leather, treated meats, and "all-wool" clothes which are three-quarters shoddy can be made to pass muster as good materials and the public can be fooled into the

*President and general manager, Roden Coal Co., Marvel, Ala.
Note—Abstract of article read before the Alabama Coal Operators' Association at the session held July 26, at Marvel, Ala.



GROCERY COUNTERS AND SHELVES

A department store rarely handles groceries, as little profit can be made on these staples. The commissary trade is largely in such articles and so some profit must be made on them if any is to be obtained.

Courtesy from clerks should be enforced in the commissary as much as in a store which is dependent on the trade of the general public. Because the clerk has a cleaner job, his work is not in any way more honorable. He is employed to sell and not to comment on the customers. Some miners have been farmers and small dealers or have been in other lines of work, but they have engaged in mining because it is more profitable. They have accumulated savings, have education and breeding, and the commissary clerk has no reason to believe he has any measure of superiority.

But, as an excuse for the brusqueness of the store clerk, it must be remembered that business is confined mostly to the early morning and the late forenoon. The trading is done in three or four hours, and in the rush that results, impatience which engenders ill-feeling often arises.

THE INTERCHANGEABLE STORE CHECK

The practice of paying off daily in store checks which are redeemable on pay day, is bad. It saves some clerical work, but the men tend to spend more than they can afford when the checks are so handy. Moreover many are lost and never redeemed. When this scrip is exchangeable, it promotes drunkenness and gambling.

The operator owes it to the public to abolish the interchangeable store check, which may be sold to the speculator for 60 or 80c. on the dollar. With it the storekeeper can purchase goods in the store, selling them at prices below those at the commissary. The effect such sales have on the minds of the men is easily realized; they cannot understand how an outsider can sell for cash at a price considerably below the commissary store and yet make money. The interchangeable check is also a boon to the bootlegger.

At some mines, the right to buy checks is restricted to the superintendent, store and office force, and they purchase them at a discount to pay their store bills. This justly creates dissatisfaction among those who are not permitted to engage in the lucrative business.

I realize that the boarding houses must have some way of securing their board money, but the use of interchangeable store checks is not the method I prefer. At Marvel, we allow each boarding-house keeper to turn into the office his charges against the boarders. This amount is charged to the men and credited to the boarding-house keeper who can then draw checks bearing their name.

As a rule, the goods sold in a commissary are of better quality than those to be found in the small competing store. This is made possible by the mining companies buying larger quantities of merchandise each month, thus securing a fresh supply. The small store does not keep perishable merchandise because the profit is small or the business is entirely unremunerative. Thus bread, meats, vegetables, fruits, ice, pure candy, fish and fresh eggs are only purchasable at the commissary.

Of course, some of the companies are near farming districts or towns, and the men can buy elsewhere and do not have to rely on the commissary for such articles. Some of the mining villages are so placed that unless the commissary supplies these articles, the men must do without them. It would be a surprise to some of our city friends to know that the company-store customers often have peaches, watermelons, canteloupes and other fruits and vegetables before they do.

A 30- OR 40-PER-CENT. SAVING

Commissaries pay no rent, do no advertising, should have no losses on bad credits and have small delivery charges, all of which cost usually from 8 to 10 per cent. of the gross profit. They are thus enabled to sell goods of the same quality at lower prices than competing stores having the same freight rates. These advantages have made the company store so successful that unsuccessful competitors have been great agitators against the commissaries.



DRUGS, CANDY AND TOBACCO DEPARTMENT

In this way he does not accept the boarders' checks in payment and use them in trading at the store.

Many managers and store clerks claim that they cannot remember their customers' names. This is because they do not wish to take that trouble, and I would recommend that in such cases, the commissary force be changed.

ADVANTAGES OF THE COMMISSARY TO THE EMPLOYEE

When a man is improvident or a heavy drinker, though he may be a good worker when sober, the commissary prevents hunger and want. His wife can always draw a check if the man has any credit for time at the office. If there is one pay day or even two a month, his earnings if paid to him in bulk would be spent in a day or two and there would be nothing for the remainder of the month or fortnight. Many wives and mothers declare that the commissary is a blessing to them. The ability to secure food and clothing if the husband works only a few days in the week lessens the loan-shark evil. Much time is saved to the busy housewife by having all the places in which she must shop under one roof.



MILLINERY SECTION WITH APPROPRIATE FITTINGS

The employer gets many benefits from his store. It enables him to become acquainted with the men and by giving them a square deal he breaks down the old idea that the mine owner has no interest in his employees other than the profit he can make out of their labor. The store prices can be made one of the attractions of the town.

HOW THE COMMISSARY HELPS THE OPERATOR

The garnishment of the goods of the employees would swamp the companies if they did not have their own commissaries to provide the necessities of life. A garnished man is always on the move. He appears to get the habit, and many railroads discharge the chronic garnishee because he cannot be relied on.

Coal should be sold at a profit, and the commissary should not be regarded as the main profit maker. The Federal census report for 1909 shows that the Alabama mines made only 1.5 per cent. on the capital invested. This is a ridiculous return for a business which is so short-lived and hazardous. The same report showed a net profit on other lines of business of from 8 to 15 per

cent. It must be remembered that this report did not include any allowance for depreciation on mines or equipment. On the other hand, store profits and house rents were not included in the mine balance. This clearly shows where the profit was made, if any, and I do not regard such methods of obtaining a surplus necessary or desirable.

SALESMANSHIP IS NECESSARY IN COMMISSARIES

The goods in a store should be prominently displayed. Counter show-cases are silent salesmen and big earners. Several trips a day are often saved by having goods in full view, and in rush hours customers may see and select their goods while the clerk is waiting on others. This tends to save the clerk's time.

Do not let your goods get shopworn. Sun, flies, dust and excessive handling consume much profit, as no one wants shopworn goods. Fresh goods are the best sellers, with the result that you are less liable to have odd sizes and old patterns in your stock. Have a clearance sale at least every season, as it does not pay to carry over the majority of season goods. This is particularly important in the shoe department, as styles change and our men are quick to learn which are the latest.

Do not allow the traveling salesman to do your buying. Remember his is the selling end, and his knowledge of the wants of one mining town may not fit another. There are some who are not averse to selling all the store manager will buy.

PADDED INVENTORIES

Commissary managers are only human; if the management requires a certain per cent. of profit on each year's business, it is only natural for him to prefer to inventory old stock at full value, than to sell below cost, thus making a poorer showing. Often a new manager finds himself saddled with a quantity of outofdate or spoiled merchandise. If he cleans up this, his first year's earnings may possibly show no profit; yet the owner is the gainer by such bargain sales as this old stock decreases in value rapidly after the first year.

I have known some articles to be kept in stock and on the inventory as many as ten years, at the original cost; when, as a matter of fact, much could hardly be given away. The only remedies which occur to me for these conditions are to have the date of purchase put opposite doubtful articles on inventory, or, better still, to have personal inspection by a competent higher official.

HOW TO INCREASE BUSINESS

Do not look so much at the per cent. of earnings as compared to sales, but lay more stress on the total net profit. Very often a reduction in price will increase the volume of trade, so that there is a greater profit on the year's business. This is the method followed by the department stores. Too many of the goods we sell are staples, and only small profits can be made on them. Consequently a good business man would consider the introduction of other lines of merchandise on which there are larger profits.

Do not ask your superintendents, mine foremen or office force to solicit business. Have it distinctly understood that there is no compulsion to trade in your store. A man's place in the mine must not be dependent, either directly or indirectly, on his trade. It is the better way

to encourage salesmanship by keeping separate records of each clerk's sales, and by paying him accordingly. By this method the good men do not have to average with the lazy clerk, and you can weed out the latter. Cash registers both save honest clerks from suspicion and protect the owners from their dishonest salesmen.

Educate your customers, by your prices, to buy in bulk, not for each meal. Do not substitute, and do not let the houses from which you buy foist substitutions upon you. One of the hardest things we had to do was to break our wholesale men from shipping the wrong brand and more merchandise than was ordered.

Let your competitors handle articles for which you have few calls, such as odd-sized shoes. Much money can be tied up in this class of merchandise. Let us all keep open to new ideas and search for new devices which will lessen labor and legitimately increase profits.

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The New Ohio Law

A new law goes into operation in Ohio, Sept. 1, to which we have made reference editorially, in another column. The law makes some sweeping changes in the operation and control of seven state departments.

That the provisions of this enactment are drastic, in many respects, is shown by the following brief synopsis of the powers and authority it confers on the commission, as taken from Sec. 22 of the act; namely:

(1) To appoint advisors, who shall without compensation assist the commission in the execution of its duties. To retain and assign to their duties any or all officers, subordinates and clerks employed in the several departments absorbed by the commission.

(2) On and after the first day of September, 1913, to administer and enforce the general laws of the state relating to mines, manufacturing, mechanical, electrical, art and laundry establishments, child labor, employment of minors, etc., going through the entire list of industrial employment.

(3) To investigate, ascertain and, on and after the first day of September, 1913, to declare and prescribe what hours of labor, safety devices, safeguards and means or methods of protection are best adapted to render the employees of every employment safe and to protect their welfare, etc.; and (4) to fix reasonable standards and prescribe, modify and enforce reasonable orders for their adoption; and (5) to fix and order such reasonable standards for the construction, repair and maintenance of places of employment as shall render them safe; and (6) to investigate, ascertain and determine such reasonable classifications of persons, employments and places of employment as shall be necessary to carry out the purposes of this act.

(8) To do all in its power to promote the voluntary arbitration, mediation and conciliation of disputes between employers and employees, etc. (9) To establish and conduct free employment agencies; and to do all in its power to bring together employers seeking employees and working people seeking employment, etc. (10) To collect, collate and publish all statistical information relating to employees, employers, employments and places of employment, etc. (11) To examine and license persons who desire to act as steam engineers, * * * to operate steam boilers, * * * to act as inspectors of steam boilers * * * and to renew or revoke such licenses.

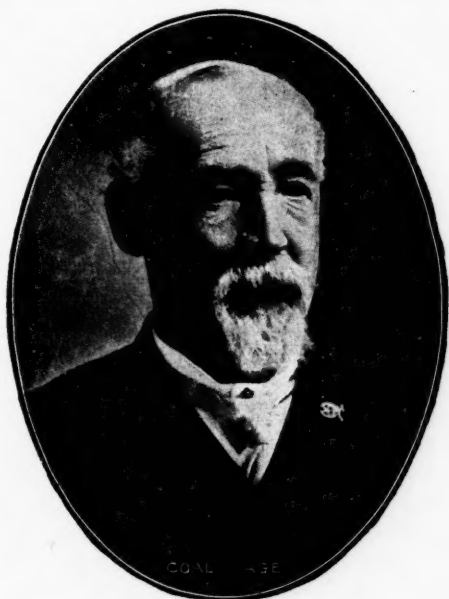
In addition to other specifications, the act provides, for the neglect or refusal of any person to obey any lawful order of the commission or to conform to the requirements of the act, a fine, for such violation, failure or refusal, of not less than \$50 or more than \$1000, for the first offense; and not less than \$100 or more than \$5000, for a subsequent offense.

In this connection, we note that a petition has just been filed with the secretary of state, at Columbus, asking for the submission to popular vote, of an amendment providing for a smaller general assembly. The petition proposes to reduce the House membership from 123 to 50, and that of the Senate from 33 to 22, basing the representation entirely upon population. This is the first attempt to amend the Ohio constitution by the initiative and referendum.

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Loss to the Coal Industry

Richard Newsam, familiarly known to the mining fraternity throughout the United States as "Uncle Dick," died at his home, Peoria, Ill., early Tuesday morning, Aug. 5. Although Mr. Newsam had been failing in health for somewhat more than a year, it was not but a



RICHARD NEWSAM

week previous to his death that his illness became serious. Blessed with a rugged constitution, he had for some time successfully fought the disease that caused his death.

Richard Newsam was born Nov. 11, 1843, in Chorley, Lancashire, England. He went to work in the mines when a mere lad. Possessed of a natural genius but limited education, he was essentially a self-made man. He was married in Hindley, Lancashire, England, May 20, 1866, to Miss Frances Wolstenholme. He rose rapidly to the position of superintendent of the mine where he was employed. His ambition early led him to this country, and he arrived in Peoria County, Ill., Sept. 28, 1869. He at once engaged in coal mining, at Kingston Mines, assuming charge of the Lowry mine, as superintendent. Five years later, 1874, Mr. Newsam, with his brother Frank, leased the mine and, later, acquired interests in 16 other mining properties in the same county, thereby becoming the largest coal operator in that section.

Mr. Newsam was indefatigable, and applied himself so diligently that, in spite of his limited education, he became recognized as a leading authority in all coal-mining matters, in his state. He was appointed a member of the State Mining Board, by Gov. Tanner, in 1897, and held that position, being elected as president of the board, until the fall of 1912, when, owing to declining health, he was compelled to resign both this position and that of manager of the state Mine-Rescue Station, which position he had held for nearly a year.

Mr. Newsam spent much energy, time and money in the effort to better the condition of mine workers, and his efforts in that direction had often received recognition in the press. He was appointed by Gov. Deneen to take charge of the rescue work at the time of the Cherry Mine disaster, in the fall of 1909. Immediately following that disaster, he presented recommendations that met with the hearty approval of the governor, and resulted in the early establishment of three mine-rescue stations in the state, at La Salle, Springfield and Benton, respectively.

Mr. Newsam was a thirty-second degree Mason, having joined that fraternity as a member of the Phoenix Lodge, at Mapleton, and later transferring to the Temple Lodge, at Peoria. He was a member of the Peoria Consistory, also the Nobles of the Mystic Shrine. Though the best years of his life were spent in this country, Mr. Newsam never lost the love of his native land, and once each year made a trip to his old home in England. He had crossed the ocean 47 times, returning from his last trip only six weeks previous to his death. He had 13 children, of whom six are still living. He is also survived by two brothers, John and Thomas, who were associated with him in the coal business, and a married sister, Mrs. Martha Harris, Hanna City. Mr. Newsam was buried Friday, at Kingston Mines, which had been his home up to April, 1900.

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Telephones for Oklahoma Mines

The Oklahoma Coal Operators' Association, through its representative, Carl Scholz, president of the Coal Valley Mining Company, has awarded a contract for 800 Western Electric mine telephones, with complete wiring and installing material. This is the largest order ever placed at any one time for such equipment.

The various mines, whose operators are members of the association, will be furnished with sufficient telephone equipment to properly safeguard the lives of the miners at work underground. Telephones will be installed in the shotfirers' refuge holes, in entries and shafts, so that constant communication with the offices at the surface will be possible and accidents can be reported promptly, proper aid being sent to the danger point at once. The shotfirers will report their progress according to a prearranged schedule and failure to report from any one refuge hole on schedule time will serve as an indication of a possible accident.

The installation of the large quantity of mine telephones is made primarily as a result of a law enacted a short time ago by the legislature of Oklahoma making it compulsory for operators to equip their mines with telephones. It will, however, undoubtedly be instrumental in increasing the efficiency of supervision as well as safeguarding the lives of the workers.

DISCUSSION BY READERS

Mixed Lights in Mining

Letter No. 9—Mining men everywhere urge safety lamps; inspectors have advocated their use; former mining laws have read, where gas has been discovered, safety lamps shall be used exclusively; records of explosions have been quoted to prove that the use of mixed lights was the primary cause of the explosion; professional and scientific men have declared, with one voice, that the exclusive use of safety lamps affords a great deal more safety than where mixed lights are employed.

During the past three years, while "Safety First" has been the slogan throughout the United States, the bituminous mine law of Pennsylvania has been changed and the standard lowered, from the highest degree of safety secured under the old law, to the questionable safety that the present law affords, by authorizing the manager or foreman, with the inspector's approval, to employ either open lights or safety lamps. It is quite certain that such discretionary power will be used more or less, according to the cry for coal. This is undoubtedly a step backward instead of forward.

In respect to lamps for general work, it seems to me that the safety lamp offers 100 per cent. of efficiency in respect to safety, where the use of the open light materially reduces that percentage. This statement should, of course, be modified according to the amount of gas generated in mines.

It is a fact worthy of note that legislation in some states is increasing the safety of the mines, while in other states the direct reverse is true. This is a serious mistake, and cannot fail to reflect discredit on much mine legislation of the present day. In my opinion, it is an error to replace a law by which the highest percentage of efficiency is obtained in respect to safety, by a law which makes the safety of a mine depend on the judgment of one or two men, or the truthfulness and trustworthiness with which mine workers will obey the mine regulations. To permit the use of open lights, in a portion of a mine requiring the use of safeties in certain other portions or districts, is like courting danger, to see how far one can approach the danger line and still be safe.

For the sake of illustration, suppose a mine is working exclusively with safety lamps; and, after a considerable period, no gas having been discovered, the foreman, with the authority of the mine inspector, discards the safeties and installs open lights throughout the whole mine. After a time, a gas feeder or a clay vein is cut, and gas is generated in quantities not expected or previously known in that section. As a result, an explosion occurs, which the press states was caused by striking "an unexpected pocket of gas"; and this is the reason given for the sacrifice of some 50 to 100 lives. To the public, the accident, which was unforeseen, was unavoidable; whereas, the disaster would never have occurred if the mine had continued to work on safety lamps exclusively. The mine was in a section not devoid of gas, and the risk assumed was too great.

An experience of 27 years in bituminous coal mines, in many positions of greater or less importance, has convinced me that the use of mixed lights is a pernicious practice. It is true the miner is willing to work, and generally prefers to work, with an open light; but the average miner has not the intelligence of the average foreman, and, as a result, the miner assumes many unwarranted risks. In a district where gas is known to exist, there is no certainty of a mine being exempt from its appearance in the workings at any time, although a long period may elapse in which no gas is discovered. The mine may develop gas in dangerous quantities, with little warning.

The use of open lights in one section and safety lamps in another section of the same mine is similar to permitting the use of pipes and open lights in the offices of a powder factory, within the same inclosure as the mill itself. There are no explosive ingredients in quantity in the office, but safety lies in the exclusion from the office and the mill of these elements of danger. The open-light section of a mine bears the same relation to the safety-lamp section that the office bears to the mill, it being often necessary for employees to pass from the one into the other.

In my opinion, safety lamps should be used in most mines whether these are classed as gaseous or nongaseous. By adopting this practice, we follow the slogan "Safety First." The old proverb, "An ounce of prevention is worth a pound of cure," may well be applied in respect to the safety of mine operations.

I have had charge of several safety-lamp mines, and cannot agree with the statement that the constant and exclusive use of safety lamps curtails the output of the mine. On the Monongahela River, in the Pittsburgh seam, the miners produce as much coal per man in the safety-lamp mines as they do in the open-light mines. Likewise, in the Connellsville region, where the coal is coked and mined in a different manner, the miners produce as many bushels of coal per man, in the safety-lamp mines as they do in the open-light mines, and the same is true in the soft-coal regions of central Pennsylvania.

As far as I have observed, the constant use of safety lamps does not impair the eyesight of miners; and in the safety-lamp mines the air is clearer, there being less smoke from inferior oil. Judging from my own experience, I fail to see where there is any excuse for the use of mixed lights in mining if we have proper regard for safety.

R. Z. VIRGIN, Supt.
West Virginia-Pittsburg Coal Co.

Colliers, W. Va.

Letter No. 10—After all that has been written and said with reference to safety in mining operations, the conservation of mining property, and the protection of human life, it is surprising that a number of men, whose position and influence give to their opinions greater weight than is attached to the opinions of men of lesser

rank, continue to justify the practice of using mixed lights in gaseous mines, claiming that this, in their opinion, is consistent with safety. Although this practice is sanctioned by law in this state, it is not, in my opinion, an evidence of good judgment; nor do I see how the management of a mine operated in this manner can claim that the safety of their employees is their first consideration.

Referring to the last letter on this subject, written by Joseph Northover, *COAL AGE*, Aug. 9, p. 209, it is my opinion that, while the mine he describes might be operated under the conditions stated, to do so would be flirting with a danger that might entail much suffering, loss of life and property. After a practical experience of 29 years, in the three principal coal-producing states, I have failed to find conditions where I would deem the use of mixed lights, in a gaseous mine, to be consistent with safety. In a field where no gas has been known to exist, mines can be worked with open lights with safety; but, from Mr. Northover's description, I understand he is in a gaseous field where, in my opinion, gas may be expected at any point of the development. While no gas has been discovered on the east side of the mine he describes, there is no assurance that this condition will continue for any length of time.

Besides this, there is another question to be considered before we can be assured of absolute safety in operating a mine with mixed lights. Each mine foreman knows that there is always a possibility of his orders and instructions being disobeyed; or, at least, they may not be carried out, through neglect or carelessness. As long as this possibility exists, my advice is to keep open lights out of a mine operating in a gaseous field. Use open lights only in districts where gas is unknown.

The enforced use of safety lamps throughout a mine where gas is generated in certain portions of the mine, is mentioned as a burden to both the miner and the operator alike. I want to say that if enforcing safety and removing one of the many dangers attending mining operations is a burden, it is right to impose that burden. It would be a far greater burden if disaster and loss should result from any failure to make the mine safe. After using the safety lamp for 20 years, I have failed to find a cleaner and healthier light.

The U. S. Steel Corporation have adopted for their slogan, "Safety the First Consideration," and other companies are carrying out the same principle. Loyalty to this motto will not permit the adoption of a practice that is doubtful, in respect to safety. Such a practice will ultimately become obsolete.

J. W. T.

Brier Hill Coke Co.

Brier Hill, Penn.

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The Liquor Problem in Mining

Referring to the remarks of "Subscriber," on this subject, *COAL AGE*, July 26, p. 134, it is unfortunate that he would confine the discussion of the subject to "men in charge of mines." It frequently happens that men who have had the largest experience with this evil are those holding inferior positions to that of the mine foreman or superintendent. The shotlighter or the fireboss, who travels a certain section of the mine three or four times a day, is more liable to be better acquainted with the weaknesses of men, in his particular section of the

mine, than is the foreman himself, who may possibly visit each working place once or twice a week. The foreman is very much further removed from the men socially than is the fireboss and has not the opportunity to know the habits of the men and to what extent they exercise self-control.

This correspondent also states that "the drink habit has increased with the advance in wages, if not in proportion to the same." This assertion does not conform to the facts and figures given, from time to time, by government reports, commission reports and the daily press reports, all of which agree that we, as a people and nation, are gradually becoming more sober. There is no reason to suppose that miners are any exception to this rule. The improvement in the West and particularly in the mining camps, is evident to any careful observer. There are perhaps a few camps that form an exception to this rule, but they do not materially affect the general results.

If, then, "Subscriber" is wrong in his premise that the drink habit is on the increase among miners, he is naturally wrong in his conclusion that this is the result of increased wages or earnings. As a matter of fact, wages have not increased, but have materially decreased in the last decade. I mean by wages, in this sense, the net earnings of the miner, as represented by the food, clothing, shelter, etc., he is able to provide for himself and his family. While it may be true that higher wages are now paid for certain classes of work than formerly, the increased cost of living overbalances the advance in wages received. The average miner, today, expends more labor for the same pay than a decade ago.

In my opinion the liquor problem, in mining, cannot be solved either by the black-list or the certificate plan. A more sane treatment of miners is to deal with them as men in need of education. They must be shown that liquor is incompatible with their best interests. The movement now being made by many of the large coal companies, to provide better housings, more sanitary mining camps, and clean, healthy recreations, is doing much to overcome the evils of the drink habit among their men. I am convinced that these efforts will eventually bring good results in the line of sobriety and clean living, and will pay interest on the capital invested.

W. H. MOORE.

Nanaimo, B. C., Canada.

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A Hoisting Problem

Since the publication of our answer to the inquiry of John Nelson, *COAL AGE*, July 19, p. 99, asking how to arrange the ropes in a double-compartment hoist to overcome difficulty of one rope being five and one-half in. short and the other 3 in. long, we have received three letters from correspondents, which, for lack of space, we summarize as follows:

It is a common occurrence, in mine hoisting where wooden drums are used, for the ropes to wear unevenly on the two sides of the drum; and this may be Mr. Nelson's difficulty. Assuming such is the case, when No. 1 cage is on the bottom No. 2 is hanging 5½ in. over the "stops" or "wings," at the upper landing; and, again, when No. 2 cage is on the bottom No. 1 is hanging 3 in. below the stops, at the upper landing. In this case it will do no good to lengthen or shorten either rope. For example, to lengthen No. 2 rope 5½ in., so that that cage will hang at the upper landing when No. 1 is on the bottom, would remedy the trouble only for that position of the cages. Then, when No. 2 cage is on the bottom No. 1 cage will be 8½ in. below the top.

The only way that this difficulty can be remedied is by rebuilding the winding drum, by putting on new lagging, so as to make the diameter of the drums equal on each side. Or, the difficulty may be overcome by covering the grooves with one or two thicknesses of canvas, on the side of the drum where the rope is long; or by cutting the grooves a little deeper into the lagging on the other side of the drum, using for this purpose a half-round chisel.

[The letters, of which the above is a summary, were received from Roy Hoswell, hoisting engineer, Toluca, Ill.; Harry L. Packington, hoisting engineer, Granville, Ill.; and A. Q. Davis, Uniontown, Penn. We are glad to have attention drawn to conditions such as described, which occur in daily mining practice. The answer given in reply to the inquiry of Mr. Nelson assumed a perfect condition of the winding drum, or an equal diameter throughout the length of the drum, in which case it would be necessary to lengthen the short rope $2\frac{1}{2}$ in. in order to overcome the difficulty.

In case the winding drum is worn, as mentioned by correspondents, the actual lift may be different for the two cages, for the same number of turns of the drum. For example, while No. 1 cage, referred to above, ascends the length of the shaft except 3 in., No. 2 cage falls the length of the cage plus $5\frac{1}{2}$ in., making the ratio of winding for the two cages 100 ft. — 3 in. : (100 + $5\frac{1}{2}$ in.). In this case, as stated, no lengthening or shortening of the ropes will equalize the winding.—Ed.]

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Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

PHYSICAL PROPERTIES OF GASES

Density of Gases.—The term "density" refers to the amount of matter in a given volume or space. The commonly adopted measure of density is the ratio of the weight of a body to its volume or the space it occupies, as expressed by the following formula

$$\text{Density} = \frac{\text{weight}}{\text{volume}}$$

In a general sense, the term density has thus come to mean the weight per unit volume. For example, the density of water is commonly understood to mean its weight per cubic foot (62.4283 lb., max. dens., 4° C.). In this sense, the density of a gas is its weight per cubic foot; but this is not its common significance, in mining practice, in relation to gases.

The term has, besides, a relative meaning and is sometimes called "relative density." In this sense, it means much the same as specific gravity or relative weight. Thus, the density of a gas is the ratio of the weight of a given volume of the gas to the weight of the same volume of another gas taken as a standard, both gases being measured at the same temperature and pressure.

Hydrogen the Standard for Density.—Since hydrogen is the lightest gas known, it is a convenient base or standard of comparison and its density is taken as unity or 1.

Relation of Density to Molecular Weight.—The molecular weight of hydrogen is 2 and its density is therefore one-half its molecular weight. But since the density of all gases is proportional to the weight of the gas, volume for volume, it follows that:

The density of any gas referred to hydrogen as unity is one-half of its molecular weight.

For example, to find the density of water vapor (H_2O), first calculate the molecular weight of the vapor; thus,

$$\begin{aligned} \text{Water vapor } (\text{H}_2\text{O}); \text{ H}_2 &= 2 \times 1 = 2 \\ \text{O} &= 1 \times 16 = 16 \end{aligned}$$

$$\text{Molecular wt.} = 18$$

The density of water vapor is then $18 \div 2 = 9$; that is to say, water vapor is nine times as heavy as hydrogen, volume for volume.

Difference Between Density and Specific Gravity.—In a general sense, these two terms are used synonymously. The term density, in a more restricted sense, relates to the quantity of matter in a given volume or, in other words, to the mass per unit volume; while specific gravity relates to the relative weights of different substances, per unit volume, referred to a certain fixed standard as unity. Since density is referred to hydrogen and specific gravity to air, as unity, air being 14.4 times as heavy as hydrogen, at the same temperature and pressure,

$$\begin{aligned} \text{Density} &= 14.4 \times \text{sp.gr.} \\ \text{Sp.gr.} &= \text{density} \div 14.4 \end{aligned}$$

Waste of Coal

A short time since, I noticed an article on "Waste of Mine Timber," COAL AGE, July 5, p. 26. I have recently observed a similar waste of coal, in the conveyors carrying slate to the dump, and in the condemned coal returned to the breaker, to be cleaned. I believe this waste of coal occurs in most of the breakers in the anthracite region and, with proper attention, could be largely avoided.

In many cases, I have noticed a considerable percentage of pure coal free from slate and, again, coal that has not been separated from the slate. This coal is absolutely lost, being thrown out on the dump. Following the condemned coal that is returned to the breaker I have noticed that the men often throw out as much coal as slate. From my observations, there is no small percentage of coal lost, in this manner, which could be prevented by a closer supervision of the work.

In many cases, much coal, time and labor could be saved by recrushing this coal and passing it again through the breaker. This is done in some breakers, but not to the extent that it should in all breakers. There is less waste in the treatment of the smaller grades of coal than in larger sizes.

MINER.

Scranton, Penn.

The Coal Age Pocket Book

Specific Gravity of Mixtures of Gases.—When different volumes of gases of different densities are uniformly mixed the density of the mixture is determined by dividing the combined weight of the mixed gases by the total volume of the mixture, which will give the unit weight or the weight per unit of volume of the mixture.

The actual weights of the gases may not be known, but only the volume of each gas and its density or specific gravity. In that case, multiply the density of each gas by its volume, add the products together and divide the sum by the total volume of the mixture; the quotient obtained will be the required density of the mixture.

Or, in like manner, multiply the specific gravity of each gas by its volume, and divide the sum of these products by the total volume of the mixture, and the quotient obtained will be the specific gravity of the mixture.

Calculation.—For illustration, let it be required to calculate the specific gravity of flashdamp, which has a theoretical composition of 1658 volumes of methane (CH_4) to each 1000 volumes of carbon dioxide (CO_2). The process is as follows:

	Volume	Sp. gr.	Relative wt. (air = 1)
Methane,	1658	$\times 0.559$	= 926.8
Carbon dioxide,	1000	$\times 1.529$	= 1529.0
	2658		2455.8

The specific gravity of the flashdamp is then calculated, in accordance with the above rule, as follows:

$$\text{Sp.gr.} = \frac{\text{relative wt. (air = 1)}}{\text{relative total vol.}} = \frac{2455.8}{2658} = 0.924 \text{ nearly}$$

Calculation Based on the Law of Diffusion of Gases.—If two gases diffuse into each other, directly, without being diluted with air, the volumes of the gases are inversely proportional to the square roots of their densities or specific gravities. This law makes it possible to calculate the density or specific gravity of such an undiluted mixture of two gases directly from their densities or specific gravities, without reference to their relative volumes. This is accomplished by means of the formula

$$D = \frac{a\sqrt{b} + b\sqrt{a}}{\sqrt{a} + \sqrt{b}}$$

in which D = density or specific gravity of the mixture; a and b = the corresponding densities or specific gravities of the two gases, respectively.

Calculation.—For illustration, let it be required to calculate the specific gravity of flashdamp (undiluted mixture of methane and carbon dioxide) directly from the specific gravities of these gases; methane = 0.559 and carbon dioxide = 1.529. The process is as follows:

$$\text{Sp.gr.} = \frac{0.559\sqrt{1.529} + 1.529\sqrt{0.559}}{\sqrt{0.559} + \sqrt{1.529}} = 0.924$$

EXAMINATION QUESTIONS

West Virginia Examination

(Continued from last issue)

Ques.—If this were a gaseous mine, how would you prevent accumulation of gas in the gobs when pillars are drawn?

Ans.—As the pillars are drawn, all timbers should be pulled, and care should be taken to cause a fall of roof, so as to practically close each place, as the work proceeds. Any void places remaining open must be thoroughly ventilated by a sufficient scale of air; otherwise, the place must be closed by an airtight stopping.

Ques.—The scale of this map is 1 in. = 200 ft. (a) How many tons of coal can be produced from the mine, assuming the coal to be 6 ft. thick and all grades favorable to the loaded cars? (b) What quantity of air will be required to properly ventilate this mine? (c) How many men will be required to produce this tonnage? Explain fully. (d) Where would you build your permanent stoppings and overcasts?

Ans.—(a) The development shown on the map should yield, say 1000 tons per day. (b) There should be a circulation of 125,000 cu.ft. of air in this mine.

(c) To insure an output of 1000 tons per day will require about 200 miners, working single with a helper; or, say from 250 to 300 miners working double.

(d) The permanent overcasts and stoppings are indicated on the map by their proper symbols.

Ques.—Describe a good system of ventilation for a seam of coal 5 ft. in thickness, with a large acreage and soft, friable roof; the mine liberating some explosive gas and the production of coal being 3000 tons per day.

Ans.—The four-entry system should be used for the main slopes or entries, while the cross-entries are driven on the double-entry system. The mine should be ventilated on the exhaust system, the two central entries of the main roads being used as intake airways and haulage roads, while the two entries flanking these are made the return airways for their respective sides of the mine.

Rooms are opened to the rise side only of each pair of cross-entries; and the mine is divided, preferably, into separate panels, working, say from 50 to 60 men in each panel. This is accomplished by driving cross-headings between the consecutive pairs of cross-entries, as the work progresses. Each panel is supplied with its own separate ventilating current, by building an overcast at the mouth of each pair of cross-entries, early in its development. The return air from each panel is conducted at once into the main-return airway, while the coal is hauled through the crosscut near the mouth of each pair of cross-entries and taken out on the intake air to the main-haulage road.

The main-haulage roads should be driven 10 ft. wide, one being used for the loaded cars and the other for the empties. To provide an output of 3000 tons a day will require from 10 to 12 panels, each producing from 250 to 300 tons. Each panel should be ventilated by a cur-

rent of 12,000 to 15,000 cu.ft. per min., which should be made to sweep all void places in the roof or other parts of the mine.

Ques.—Describe the difference there is in respect to the safety of a dusty mine, in the natural condition of the air entering and traveling through the mine, during the summer and winter months.

Ans.—In the summer season, the outside air has practically the same or a slightly higher temperature than that of the mine, while in the winter season the outside air has always a lower temperature than that of the mine. As a consequence the intake-air current, in the winter time, experiences a rise of temperature shortly after entering the mine. Under these conditions, the intake current is not fully saturated when it reaches the inside workings, but has a capacity to absorb moisture from the dust and coal that accumulate at the working face and on the haulage road.

This drying action of the air current prevails to a greater or less extent in the mines, during the winter season, regardless of whether the outside air is or is not fully saturated with moisture. The outside air may be fully saturated, on a damp cold day, and yet the intake-air current be quite dry, a short time after entering the mine.

Ques.—What, in your opinion, determines the best system of timbering the various roofs in coal mines, for headings and rooms?

Ans.—The nature of the roof, floor and coal, depth, inclination and thickness of the seam, and the method of working adopted must always determine the best system of timbering to be employed, under the particular conditions existing in the mine. In general, it is safe to say that the adoption of a regular system of timbering, designed to meet the particular conditions in a given case, will result in greater efficiency in respect to safety and economy of working, than any irregular or haphazard method. Even under the best conditions of roof and floor, there is danger in leaving the question of timbering the working face, to the judgment of the miner.

Ques.—What precautions should a miner use when undercutting coal?

Ans.—Before starting the work of undercutting the coal, the miner should carefully examine the roof above him. He should consider that there may be a break in the roof over the coal that is not visible, in which case, when the coal is mined (undercut) the full weight of the roof over the opening will be thrown on the unsupported coal face. This is what often happens, and the result is a fall of coal that catches the miner at work. It may take a little time, but a careful miner working under a roof with which he is not fully acquainted, will always set a prop or two in such a manner as to protect himself from any unexpected fall of slate. It is also important to sprag the coal as rapidly as it is mined. The sprags should be set firmly so as to prevent any settlement of the coal during the undercutting.

COAL AND COKE NEWS

Washington, D. C.

Little progress has been made during the past week in further developing the attitude of the administration now in charge of the Government with respect to the coal situation and the method of dealing with it. The action of the Interstate Commerce Commission with regard to the anthracite coal cases still remains in abeyance, although it is supposed that the delay is now nearly at an end and that final decisions in these cases will shortly be handed down.

The inactivity of legislative leaders with respect to attempting any investigation of coal conditions as they have been requested from many sources to do, is believed to mean that they are awaiting the action of the administration with respect to the anthracite cases in order that they may guide themselves somewhat by the outcome of the commission's findings in that regard. If it should appear that the rates on anthracite coal are too high at present and call for reduction, and if such reduction should be directly ordered and should go into effect, it is believed that little more could be done by the Government under existing conditions, looking toward the actual control of the situation in the anthracite fields.

It is probable that after the decisions have been handed down by the Interstate Commerce Commission in these cases, the whole subject will be taken up afresh and will be worked over to see whether there is anything further that can be reasonably attempted beyond the removal of the tariff provided for in the pending measure and the cut in freight rates supposed to be likely to be ordered in the forthcoming decisions.

Coal and the Cost of Pig Iron

One of the most interesting discussions of the past week in connection with the metal schedule now pending in the Senate has dealt with pig iron and the competitive possibilities of the United States in producing pig iron, especially as affected by the cost of coal in connection with the smelting process. Senator Oliver, of Pennsylvania, in this connection has furnished some information that has not heretofore been developed, and that has a bearing upon the coal and pig-iron situation as affected by the proposed rates of duty.

Mr. Oliver's contention is that the so-called "merchant furnaces" cannot live under free trade in pig iron, although he thinks that the greater manufacturers, making tonnage steel, and pouring out of each blast furnace an output running up to 400 or 500 tons a day can struggle along under free trade, despite the fact that the independent manufacturers cannot. He goes on to argue that new competition in iron and coal is to be expected from China and in that connection offered the following testimony:

I have a friend who a little more than a year ago visited China and while there he went to visit a steel works at Han Yang and this is what he said about it: "They have enormous deposits of iron ore, very much higher in iron than ore we now use and running from 62% to 65% iron. This ore is almost free from sulphur and is low in phosphorus. They have an abundance of excellent coking coal, which can be mined at very low cost, because they have the cheapest labor in the world.

"To one who has never visited China this may appear as an exaggeration, but it is a fact. I believe it is possible to produce pig iron and finished steel more cheaply in China than in any other country in the world. . . . The Chinese coal miner is paid 7c. for a day of 12 hours; in addition he receives his food from his employer, but this consists of only about one cent's worth of rice and meal. Coal at the pit's mouth is 35c. per ton. It is transported to the river or railroad by coolies, the lowest class of Chinese labor. The coolie is paid 1c. for carrying on his back a 400-lb. load of coal in some instances a distance of more than a mile from the mine to the export station. These coolies work only every other week. . . . It costs a Chinese workman only about 90c. a month to live."

HARRISBURG, PENN.

Members of the new Pennsylvania Public Service Commission met with Governor Tener on Aug. 4 for the purpose of organization. The members arranged to dispose of accumulated business, and stated that one or more commissioners will be in Harrisburg every day and meetings will be held twice a month.

One of the first opinions to be handed down by the commission, was, that no demurrage should be charged on any cars which, by reason of the frozen condition of the cargo,

were incapable of being unloaded within the free period after delivery and which were unloaded within that period after the condition of the coal admitted of that being done.

The opinion is the result of a complaint filed against the Pennsylvania R.R. Co. by the Terminal Coal Co., of Philadelphia. The complainant was asked to pay a demurrage of \$52, but this was protested on the ground that the frozen condition of the coal was the only cause for the delay in unloading and that this condition was beyond control.

The commission found that the coal was so frozen when the cars were constructively delivered as to prevent the prompt unloading of the latter and that the actual unloading was accomplished as rapidly as the condition of the coal would permit.

On Aug. 19, after a hearing, the commission will take steps to promptly fix the telephone rates throughout the state. The three members of the old Railroad Commission are familiar with the situation and the idea is for the representatives of the telephone interests to present their objections to the tentative rates so that the new members will have the necessary data. Shortly after this hearing the schedule will be adopted.

On Aug. 20 a hearing will be held before this commission in the matter of the complaints of the manufacturers' association of York and Lancaster concerning the rate on bituminous coal from the Clearfield District.

No date has been set for a hearing of the complaints on anthracite coal to Philadelphia.

A Recent Report

In a recent report made to the United States Government by Prof. Emery R. Johnston, of the University of Pennsylvania, it is interesting to note that the influence of the Panama Canal on the American trade is a matter of lively interest to coal operators and land owners of Pennsylvania. It is conceded that the opening of the canal in 1914 will greatly enlarge the American coal trade and reflect a substantial measure of prosperity into the business, and, furthermore, that it will strengthen the value of coal in the state, especially coal which has the advantage of cheap rates to vessel ports.

Perhaps no coal in the country is more favorably situated in this respect than the Pittsburgh coal lying along the Ohio River and its navigable tributaries. Large bodies of fine Pittsburgh steam coal exist in the Panhandle of West Virginia, of which a great deal is held by capitalists of some of the western counties of Pennsylvania. These lands are destined to come into this market. The coal can be shipped all the way by water. From the pit mouth or the river tipples it can be loaded in barges and boated to New Orleans and the Gulf, where it may be transferred to ocean-going vessels for points on the Pacific Coast.

PENNSYLVANIA

Anthracite

Ashley, Penn.—It is expected that the Ashley planes of the Central Railroad of New Jersey, which have been closed down for repairs the past month or more, will resume operations by Aug. 16.

Pottsville—The inquest to determine the cause of the disaster, which killed 20 men at Tower City on Saturday, Aug. 2, will be held at Pottsville on Tuesday, Aug. 19. Many state mine inspectors and mining officials will attend, as well as representatives of the U. S. Bureau of Mines.

The bodies of the two firebosses have not as yet been found, and it is feared that they are buried under tons of debris.

For five minutes on the afternoon of Aug. 6, while the funeral of John Lorenz, a district superintendent in the employ of the Philadelphia & Reading Coal & Iron Co., was proceeding to the cemetery, the wheels in every one of the Reading's 40 operations were stopped and 30,000 employees stood in silence, thus paying tribute to the memory of the departed superintendent and the other 18 men who met death at the same time.

Pittston—Seven West Pittston boys were recently arrested on the charge of stealing rides on coal trains on the Bloomsburg division of the Lackawanna R.R. The arrests were made on complaint to the Lackawanna officials that these

boys had hurled chunks of coal through the windows of the engine house placing in jeopardy the life of engineer John Davis and the men he might be raising from the mine.

Tamaqua—Among the sales recently recorded in this region was a piece of coal land in the Owl Creek Valley, from Fink & Co. to the Eastern Pennsylvania Coal Co. The land which was transferred is in dispute and litigation is now pending to determine the ownership. About six years ago Fink & Co. secured a lease on the ground but never did any development work until about a year ago. In the meantime other parties secured an option on the property, and were surprised when making an investigation to find that it was being developed.

Wilkes-Barre—In blasting away rock for the foundation of the new office building for the Lehigh Valley Coal Co. a vein of coal was encountered and miners were called in to properly deal with it. Several tons have already been removed, but sufficient quantity will not be encountered to pay for the extra expense of employing mine workers instead of laborers. The encountering of the coal in the excavating work will not greatly retard progress on the building.

Bituminous

Johnstown—The Penn Public Service Co. has signed a contract with the Loyalhanna Coal & Coke Co. to furnish power to its new mines at Cairnbrook, Somerset County. There are two new openings at Cairnbrook which will shortly be put in operation.

The Penn Public Service Co., which is rapidly completing high-power lines through this section of the state, is dickering with a number of large coal operators to furnish them with power, especially in Indiana, Cambria and Somerset Counties.

St. Marys—The Allegheny River Coal Co. has just discovered a new 8½-ft. bed in mine No. 5, near Furnace Run, in Armstrong County.

Osceola Mills—The Shoemaker Coal Co., of Philadelphia, has bought the Monarch shaft of the Osceola Coal Co., here, and will increase the capacity at once. The White-Dugan Co., near here, is opening a new slope at No. 1 mine to increase capacity.

Monongahela—The coal operators in this district are complaining of the scarcity of miners and as a result the mines are losing about 15 per cent. of their capacity. These conditions are depressing to the operators as there is at present a strong demand for Pittsburgh coal, and many of the larger companies have been compelled to buy coal in order to fill their contracts.

Sykesville—On the evening of Aug. 6, the men employed at the Cascade Co.'s shaft at Sykesville, held a meeting and decided to strike for the adjustment of conditions prevailing at that operation. This decision will affect 200 men.

WEST VIRGINIA

Bluefield—Six hundred miners are affected by the wage agreement signed Aug. 6, between representatives of the United Mine Workers of America and the Wyatt Coal Co., the Coalburg Colliery Co. and the Dry Branch Coal Co., operating mines on lower Cabin Creek. The price per net ton has been fixed at 30c., an increase of 3c. over the amount paid at other mines in the same field. The agreement is to expire Apr. 1, 1915.

The mines in the Pocahontas field and some in the Thacker and Red Jacket field will adopt a semi-monthly pay day effective not later than Oct. 1. It is also reported that a nine-hour work day will be adopted at a number of operations. At some operations the semi-monthly pay will begin Sept. 1, and it is expected that the Norfolk & Western R.R. will also adopt the bi-weekly pay day.

Charleston—On Aug. 6, an agreement was reached between representatives of the United Mine Workers of America and of the Laing, and Dickinson Mines on Cabin Creek, by which these operations are to work under the recent agreement. Since May 1, these mines have been working under the proposition suggested by Governor Hatfield.

Mine inspector Mitchell has during the past few weeks been prosecuting a number of the miners in his district for violating the state laws. Most of these violations occurred in the mines of the Pocahontas Consolidated Collieries Co., and the fines imposed ranged from \$10 to \$20.

ALABAMA

Birmingham—The Maryland Coal Co. has begun dumping coal at its new mines at Sipsey, Ala., and expect within 90 days to have the output up to 600 tons per day and ultimately to reach 1000 tons daily.

KENTUCKY

Frankfort—The Kentucky Railroad Commission has handed down an opinion in which it holds that it is without jurisdiction to give any relief to the coal miners of Ohio and Muhlenberg Counties, Ky., who complained that they were kept idle by reason of the failure of the Illinois Central R.R. to furnish cars to the operators in those counties.

Hazard—The plant of the Hazard-Dean Coal Co. is well under way, and the company hopes to be loading out coal by the beginning of the fall season. A large force of men is engaged in grading the company's track up Messer Branch, and work is about to start on a tippie of the latest design. A large power house, the necessary commissary building and about six miners' houses are next to be built. The company proposes to equip a thousand-ton mine, and is laying its plans accordingly.

McRoberts—The Bank of McRoberts is the newest financial institution in the coal fields. It was incorporated recently with a capital stock of \$25,000, the organizers being John E. Buckingham, I. N. Camden, George T. Watson and W. S. Perry.

OHIO

Steubenville—Joseph Specher was killed and Mige Osgan was fatally injured from being struck by a runaway coal car at the Wright Coal Co.'s plant in Bergholz, Aug. 8.

Columbus—Ohio will soon have a mine-rescue car which will cost approximately \$10,000. It will be equipped with kitchen and sleeping room for the attendant who will live upon the car. It will be kept on a spur track ready for immediate transportation to the scene of any mine disaster.

Athens—The mine of the Calvin Essex Coal Co. will be in operation in Meigs County on the lands of the Athens and Pomeroy Coal & Land Co. soon. The holding company is composed of Athens men who own 700 acres of land in Salisburg and Rutland Townships, 2½ miles northwest of Pomeroy. The local company has completed the grading of a mile of railroad track to the mine site where the operating company is now grading for a power house and tippie and starting to open up the mine.

INDIANA

Brazil—Crawfordsville and Greencastle capitalists have purchased at receiver's sale the property and leases of the Indiana Coal & Clay Co. at Patricksburg. The price paid was \$2870, the financial encumbrances of the company, together with unpaid royalties.

ILLINOIS

Witt—The local Peabody Mine No. 12 is temporarily to receive power from Taylorville for the driving of the recently installed electric motors. This is necessary since the Peabody plant at Kincaid, from which current will later be received, has not yet been completed.

Bloomington—A large acreage of oil and gas land has recently been leased in Shelby County, and drilling operations will soon be begun.

OKLAHOMA

Oklahoma City—To protect the thousands of miners working in the coal mines, the last Oklahoma legislature passed a law requiring all such mines to install telephones. These are to be located every 1000 ft. in the mine and connected to the surface. By this arrangement there will never be a man over 500 ft. from a telephone, which in case of an accident or explosion will render communication to the surface quick and certain.

FOREIGN NEWS

Santiago, Chile—An appeal has been made to the Minister of Industry and Public Works by several miners' societies, asking that he use his influence with the coal companies to reduce the working day to nine hours. In some of the mines the men are being worked 12 hours, it is declared. Organizations among Chilean miners are mostly social and cannot be compared with the unions in the United States.

RECENT COAL AND COKE PATENTS

Miners' Drill—T. S. P. Skeen, Sandoval, Ill.; 1,065,005, June 17, 1913. Filed June 20, 1912. Serial No. 704,811.

Gas Producer—L. Moore, Glasgow, Scotland; 1,065,315, June 17, 1913. Filed Jan. 28, 1913. Serial No. 744,774.

Improvements in Crushers—T. J. Sturtevant, Glen Road, Wellesley Farms, Wellesley, Mass.; 29,949 of 1912.

Gas Producer—J. A. Herick, New York, N. Y.; 1,063,540. June 3, 1913. Filed July 10, 1911. Serial No. 637,615.

Smoke Consuming System. E. G. Hatch, New York, N. Y.; 1,064,477. June 10, 1913. Filed March 7, 1911. Serial No. 612,848.

Protective Device for Miners. J. W. Reed, Cedar Grove, W. Va.; 1,064,378. June 10, 1913. Filed Sept. 18, 1912. Serial No. 721,058.

Method of Producing Gas. O. H. Ensign, Los Angeles, Calif.; 1,064,625. June 10, 1913. Filed May 27, 1909. Serial No. 498,764.

Apparatus for Quenching Coke. W. Reubold, Charlottenburg, Germany; 1,065,081. June 17, 1913. Filed June 1, 1912. Serial No. 700,966.

Coal Washer and Ore Concentrator. A. P. Campbell, Asheville, N. C.; 1,065,213. June 17, 1913. Filed June 5, 1912. Serial No. 701,788.

Latch for End Gates of Mining Cars. I. K. Beaver, Wilburton, Penn.; 1,064,278. June 10, 1913. Filed Oct. 7, 1912. Serial No. 724,399.

Gas Producer—J. H. Hirt, assignor to Allis-Chalmers Co., Milwaukee, Wis.; 1,064,905. June 17, 1913. Filed Apr. 29, 1907. Serial No. 370,757.

Pneumatic Feeding Device for Stopping Drills. J. G. Leyner, Denver, Colo.; 1,065,059. June 17, 1913. Filed Oct. 23, 1911. Serial No. 656,267.

Safety Device for Water Gas Apparatus. W. M. Kiley and W. J. Burtle, Grand Rapids, Mich.; 1,065,254. June 17, 1913. Filed Feb. 17, 1912. Serial No. 678,197.

Rock Drill—J. A. Thompson and E. M. Mackie, assignors to Chicago Pneumatic Tool Co., Chicago, Ill.; 1,065,007. June 17, 1913. Filed Nov. 22, 1906. Serial No. 344,568.

Automatic Car Stop with Gaging Apparatus for Mines. J. E. Gable, Cambridge, Ohio, and I. A. Gable, Byesville, Ohio; 1,064,067. June 10, 1913. Filed Aug. 18, 1911. Serial No. 644,838.

Indicating and Alarm Mechanism for the Movement of Gases in Mines. A. Szabados and H. Mueller, New Michel, B. C., Canada; 1,064,869. June 17 1913. Filed Jan. 9, 1912. Serial No. 670,256.

PUBLICATIONS RECEIVED

Department of the Interior, Bureau of Mines. Safety Electric Switches for Mines. By H. H. Clark. Technical paper 44; 8 pages, 6x9 in.; without illustrations.

Department of the Interior, Bureau of Mines, Bulletin 54. Foundry-Cupola Gases and Temperatures, by A. W. Belden. Twenty-nine pages, 6x9 in., with numerous diagrams, figures and illustrations.

University of Illinois, Bulletin No. 67. Reinforced Concrete Wall Footings and Column Footings. By Arthur N. Talbot; 114 pages, 6x9 in.; with numerous drawings, curves, tables and half-tone illustrations.

Geological Survey of Georgia, Bulletin No. 20. Mineral Springs of Georgia. By W. S. McCallie, State Geologist. Cloth-bound volume of 120 pages, 7x10 in., describing briefly the mineral springs of Georgia and giving the chemical analyses of their waters.

TRADE CATALOGS

Lidgerwood Mfg. Co., 96 Liberty St., N. Y. Bulletin No. 12. Lidgerwood Electric Hoists. Twenty pages, 9x12 in., illus. Describes many kinds and styles of hoists adapted to various uses.

The Ingersoll-Rand Co., 11 Broadway, New York. Ingersoll-Rand Products; 140 pages, 6x9 in. Briefly describing and illustrating the products of the Ingersoll-Rand Co. Many valuable tables are included in this publication.

The Biddle Hardware Co., 513-517 Commerce St., Philadelphia, Penn. Monel Metal, 54 pages, 4x7½ in. illustrated. Describes the properties of monel metal and the various forms in which it may be commercially obtained.

The Link-Belt Co., Philadelphia, Chicago, Indianapolis.

The Peck Carrier. Book No. 120; 112 pages, 6x9 in., describing the principal possibilities and illustrating various applications of the Peck carrier and its auxiliaries.

The Francke Co., New Brunswick, N. J. Bulletin No. 18, March, 1913. Francke Flexible Couplings; 11 pages, 6x9 in.; with numerous illustrations and tables describing the operation of a flange coupling which is entirely flexible.

Standard Specifications for Horizontal Return-Tubular Boilers. April, 1913; 7 pages, 5x10 in.; giving the principal dimensions and specifications of multi-tubular boilers as adopted by a large number of firms manufacturing this class of machinery.

Henry R. Worthington, 115 Broadway, New York. Worthington Volute Centrifugal Pumps for Low and Moderate Heads. W-202. May, 1913. Sixty-two pages, 6x9 in., with numerous illustrations, drawings and curves, describing the various types and sizes of Worthington volute pumps.

PERSONALS

Charles T. Faulkner, formerly sales agent of the Sterling Coal Co., has opened an office under the name of the Western New York Fuel Co.

J. H. Walker, formerly superintendent of the Sedalia Coal Co., located in the Hocking Valley field, has taken a position with the Pan-American Coal Co. as general superintendent.

Dr. W. R. Crane, professor of mining in the Pennsylvania State College, has just returned from Alaska, where he has spent the past year investigating the coal resources of that territory.

Truman Dodson, superintendent of the Morea Colliery, has been elected president and general manager of the Locust Mountain Coal Co., to succeed Baird Snyder, recently killed in an auto accident.

E. A. Anthony, who has been store manager for the Rex Coal & Coke Co. on Dingess Run for the past 2½ years, has resigned his position and will operate a coal lease for himself on Main Island Creek.

President Wilson has named **Henry B. Bidwell**, of Muskogee as chairman, **Royal J. Allen**, of Duncan, and **R. L. Kidd**, of Poteau, as the Board of Appraisers to evaluate the surface of the segregated mineral land in the Choctaw Nation.

William Mangan, who has been outside foreman at the Prospect Colliery of the Lehigh Valley Coal Co. for a number of years, has resigned his position with the company, to accept a similar position with the O'Boyle Coal Co., at Sugar Notch. **John Reidlehuber**, of the Centralia Colliery of the same company, has been appointed to succeed Mr. Mangan.

Thomas R. Jones, of Wilkes-Barre, has been appointed division superintendent of the Lehigh Valley Coal Co.'s Delano Division with headquarters at Mahanoy City. He fills the position made vacant by the resignation of Mr. William Underwood. Mr. Jones was formerly district superintendent for the Lehigh Valley Co. in the Hazleton region, and was for many years general manager of the Warrior Run Coal Co., at Warrior Run.

OBITUARY

Geo. A. Shirey died at his home in Bluefield, W. Va., Aug. 7. Mr. Shirey was favorably known throughout the entire Pocahontas coalfield. He is survived by a wife and six daughters.

E. A. Humphries, a prominent coal and coke operator, died suddenly at his Scottdale home recently of heart trouble, aggravated by the intense heat. At the time of his death he was 69 years of age.

Geo. Dana, a pioneer coal operator of West Virginia, died recently at his home in Washington, D. C., at the age of 80 years. Mr. Dana began operating coal mines on Campbells Creek about the close of the civil war, and retired from active business several years ago, since residing in Washington. He is survived by a wife and two brothers.

Richard Newsam, one of the best known coal-mining men in the Middle West, died at his home, 208 Bigelow St., Peoria, Ill., on Aug. 4, after a lingering illness of a year. Mr. Newsam was instrumental in bringing about the establishment of the mine-rescue stations in Illinois, and had held many important offices pertaining to coal mining since 1897.

CONSTRUCTION NEWS

St. Lambert, Que.—The Grand Trunk Ry. has recently awarded a contract for a 600-ton capacity coaling station at St. Lambert to the Roberts & Schaefer Co., of Chicago.

Virdeu, Ill.—Work has been begun on the foundations of the steel tippie for the Royal Colliery Co., and the work of erecting the new tippie will be pushed rapidly. The old structure was destroyed by fire on May 26 last.

St. David, Ill.—The Roberts & Schaefer Co. have received a contract from the Big Creek Colliery Co. for a new mining plant at St. David. It will occupy the site of the one destroyed by fire on Aug. 5.

New Castle, Penn.—Work will begin soon to reopen the Frank McInnis and Cartis Brown coal bank in the Brown's addition, which has been closed for some time. The mine has been leased by George Main and his son Emmet of this city.

Newport, Ind.—Haughee & Dunsford, who have been sinking a shaft on the Wimset farm, near Newport, have passed through a bed of good coal nearly 6 ft. in thickness. They are now driving entries and expect to begin taking the coal out in a short time.

Huntington, W. Va.—There appears to be a well authenticated rumor that a railroad will be built in the near future through the Guyan Valley at least as far as Pineville. Such a road would develop a practically virgin territory rich in both coal and lumber.

Louisville Junction, Colo.—The National Fuel Co., of Denver, Colo., has recently awarded a contract to the Roberts & Schaefer Co., of Chicago, for a Marcus patent picking-table screen and steel tippie for installation at the Monarch mine at Louisville Junction.

Columbus, Ohio.—The Norfolk & Western R.R. Co. is building five new side tracks which are more than a mile long, extending from Livingston Ave. to English Hill. The new tracks will increase the facilities of the Columbus yards and permit a large storage of coal.

Wilkes-Barre, Penn.—To afford additional power for general purposes, a new 450-hp. Stirling boiler is being erected at the Exeter Colliery of the Lehigh Valley Coal Co. It is expected that this installation will be complete in about one month. The new boiler replaces two smaller low-pressure boilers which have been removed.

Maynard, Ohio.—The Troll Coal Mining Co., with mines at Blainesville, is making some costly and highly important improvements at its mine. When completed a total of 300 hp. will have been added to the power equipment of the property, while many new houses will have been erected for the use of the company's employees.

Monongahela, Penn.—At a meeting of the directors of the Pittsburgh Coal Co., it was decided to rebuild the saw and planing mill, which was destroyed by fire on the morning of July 30. Plans for the erection of the plant have been completed and work will be begun shortly although a scarcity of laborers may cause some delay.

Duquoin, Ill.—The Forester Coal & Coke Co., of Duquoin, has placed an order with the Roberts & Schaefer Co., of Chicago, for the building of a 300-ton modern coaling station to coal locomotives on the Illinois Central R.R. This station will be built alongside of the steel tippie for which the same company contracted about six weeks ago with the same concern.

NEW INCORPORATIONS

Springfield, Ill.—The Elly Coal Co., of Girard, has been incorporated with a capital of \$2,000,000. The incorporators are: Albert Salzenstein, H. C. Hamilton, and B. D. Terry.

Birmingham, Ala.—The Alabama Land & Coal Co. has been incorporated with a capital of \$80,000. J. E. Seay is president, J. S. Shannon, vice-president and G. H. Peck, secretary.

Little Rock, Ark.—The McDougal Coal Co. has been incorporated at Bonanza, with a capital stock of \$9000. The incorporators are: L. P. McDougal, J. T. Gray, and others.

Edgewater, Wash.—The Hamilton Creek Coal Mining & Developing Co. has been incorporated with a capital stock of \$100,000, by E. L. Largey, Edgewater, M. M. Aldrich, Portland, et al.

Charleston, W. Va.—The Ridgwood Smokeless Coal Co. has

removed its principal office from Fayetteville, Fayette County, to Vaughn, Nicholas Co., and changed its name to the Ridgeway Coal Co.

Harrisburg, Penn.—The Auxillary Coal Mining Co., of Pittsburgh, has been incorporated with a capital of \$15,000. The incorporators are: Jacob Swires and H. H. Homer, of Phillipsburg, and H. M. Fair, of Altoona.

Des Moines, Ia.—The Central Iowa Fuel Co. has been incorporated with an authorized capital stock of \$100,000. The principal offices will be in Chariton, Lucas County, in the state of Iowa, and the purpose of the company is to mine coal and other minerals. The incorporators are A. E. Hollinsworth, Joseph Norwood, J. H. Balir, D. M. Ritten, and W. L. Read, all of Des Moines.

Charleston, W. Va.—Another coal company has been chartered to do business in West Virginia under the name of the Black Fork Coal Co., which will have offices in Fairmont, Marion Co., and chief works in Webster County. The authorized capital stock is \$200,000, and the incorporators are E. E. Frame, Fairmont, J. C. Lewis, Grafton, J. S. Beatty, Manington, J. M. Ritchie and H. W. Showalter, of Fairmont.

Louisville, Ky.—The organization of the Continental Coal Corporation of Kentucky, which will take over the Kentucky retail business of the Continental Coal Corporation of Tennessee, was completed on Aug. 7. The capital stock of the new concern is \$50,000, and the debt is limited to \$200,000. H. L. Corey, of Chattanooga, was chosen president; F. B. Martin was selected vice-president, and S. O. Le Seur was made general manager.

INDUSTRIAL NEWS

Philadelphia, Penn.—The Hirsch Electric Mine Lamp Co. has moved its factory to the corner of 12th and Wood Sts., where its manufacturing facilities are greatly increased. Through mistake this notice was printed in our last issue under the heading of Pittsburgh, Penn.

Springfield, Mass.—The Witherbee Igniter Co. has just received word from the Bureau of Mines that its portable electric mine lamp has been approved for use as a cap lamp in gaseous mines. These lamps are much more convenient and give a better light than the ordinary safety lamp.

Jefferson City, Mo.—The Chicago & Alton R.R. Co. has been authorized by the State Utility Commission to issue \$861,000 of betterment bonds, based under a general mortgage of July 1, 1912. The bonds are to pay for improvements made during the months of March, April, May and June.

Bluefield, W. Va.—The Solvay Colliery Co., at Marytown, on Aug. 1, concluded the purchase of and made the first payment on the mining lease and property of the Spring Coal Co., of Springtown. It is the purpose of the purchaser to use the coal from this development in the manufacture of coke in byproduct ovens.

Seranton, Penn.—F. H. Emery & Co., manufacturers of the Emery patent slate pickers are contemplating the purchase of the old Allis-Chalmers plant at the corner of 10th Ave. and Vine St. Additional facilities have been made necessary by the large number of orders which the picker company has been receiving recently.

Seranton, Penn.—A well authenticated rumor states that a plant will be started soon for the manufacture of a new and improved slate picker. This will be based upon the invention and patents of Charles Farrar, of Dunmore. It is possible also that the new factory will build a complete line of coal-cleaning machinery. The name of the company has not yet been decided.

Lorain, Ohio.—During the month of July the Baltimore & Ohio R.R. dumped 600,000 tons of coal over its docks at Lorain. This coal was mined in West Virginia, Ohio, and Pennsylvania, and was destined to shipment across the Lakes to Canada and the Northwest. Should the coal business continue at this rate, and the traffic officers believe that it will, it is expected that this year will establish a new record for any season of lake navigation. The prospects are that the coal tonnage will reach 3,500,000 tons.

Chicago, Ill.—Forty locomotives of the Chicago & Northwestern, and the Chicago, Burlington & Quincy R.R., are now engaged in a test of lignite as fuel. The present cost of coal in western Nebraska, Colorado, Wyoming and the Dakotas is from \$5 to \$6 per ton. Lignite, on the other hand, can be bought for \$1.75 or less. If the present test demonstrates the practicability of lignite for fuel, there will be an enormous saving in the coal bills of the railroads.

COAL TRADE REVIEWS

GENERAL REVIEW

Heavy demand for soft coal still persists, but not so aggressively as before. Tendency is toward further advances. Supply and demand well balanced for the time being. Lake tonnages heavy. Anthracite quiet, but steady, with an excellent undertone.

The constructive element in the trade has suffered a slight check during the week. Buying is more scattered, and there is an absence of the aggressive support that has characterized the recent market. No important, in fact hardly any, recession in prices has occurred, and the situation simply appears to be one of backing and filling pending further developments. Quotations are not weak, and any concessions offered find ready buyers. The natural tendency is upward and a further advance will occur immediately if any of the several expected favorable conditions materialize.

Anthracite has developed a new strength, partially because of the small shipments last month and the rigid curtailment in production, but probably more particularly because of the near approach of the consuming season. The market seems capable of absorbing the limited production, which is much curtailed and concessions on the regular company's circular are infrequent. There is an excellent undertone to the anthracite trade indicative of a marked activity this fall.

The advance in quotations on the West Virginia grades for shipment into the West, has diverted a greater tonnage of these fuels into the Eastern market, and there is already some talk of an easier situation in September. It is thus barely possible there may be a temporary slump in the spot market to the \$2.85 price on West Virginia coal, with possibly further opportunities for contracting at that figure also.

As a whole, however, the supply and demand are well balanced and the Pennsylvania grades have moved up another notch. Operators generally are worried about the heavy demand on contracts, and they would find it difficult to take advantage of any spot business. The car and labor supply continues to be the limiting factor in the Pittsburgh district; these are both fair so that production is close to the previous high records. The pressure is particularly heavy for Lake shipments. It is fortunate that the consumers are well covered as there is not much free coal, and it would be difficult to place any contracts which involve shipments prior to Dec. 1. The movement is tending to slow up which would indicate a limited car supply, or a heavier shipment of other freight.

The demand in Ohio continues as insistent as ever, and the movement is keeping up as good as could be expected. The car situation is the only disturbing factor. The domestic demand is strong, the steam consumption heavy, and the outlook excellent over the future. The loading at Hampton Roads is showing a marked improvement, the dumping being heavy, with large shipments in both the Coastwise and foreign trade; some coal is even accumulating on the piers. The heavy demand from the Northwest continues unabated, both the railroad and industrial consumption are large, and the car supply inadequate.

A perceptible slowing up is notable in the Southern market. As a result there is considerable coal on track, and the market is showing a tendency to ease. The car shortage is becoming steadily worse in the Middlewest, it being ascribed there to the absence of any relaxation of the market during the summer. The demand is insistent, the consumption heavy, while price increases have already been recorded, and will probably be followed by others. There is a particular improvement in the demand for the Western grades.

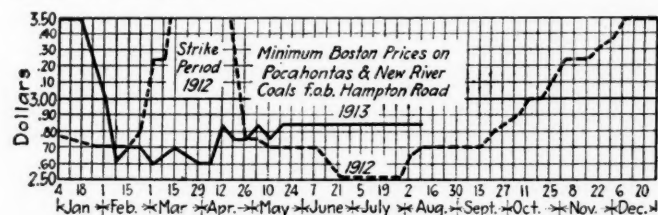
BOSTON, MASS.

A slackening demand from the West due to advance in prices on the Pocahontas and New River grades. An easier market is looked for in early September. Pennsylvania coals firm and sales are only being made for delivery this month and next. Anthracite orders coming in better than was anticipated.

Bituminous—The output of the West Virginia districts is somewhat exceeding expectations, at least for early August, and already there is talk of an easier market when September comes in. The loading at Hampton Roads shows marked improvement and few boats are now detained more than the two or three days usual in normal times. Another feature is the advance in prices for Western shipment, resulting in a slack-

ened demand from that quarter. If this particular phase continues for a month or so and output is kept up to the present market there is small question about there being a plentiful supply of Pocahontas and New River during the early fall, for the tide-water trade. This does not mean the \$2.85 f.o.b. price is at all likely to break, but simply that spot coal will probably sell down to that figure, and for a time there will be opportunity for additional purchases on the contract basis.

Meanwhile there is sufficient call for coal as it comes down, although almost exclusively on old obligations. It is, however, a market that shows demand and supply pretty well balanced. Buyers coastwise will be much interested in developments with regard to the trade West. It is being remarked that if the new scale of prices holds in that territory and the usual volume of coal moves that way in September, then by October New England may look for higher prices on West Virginia fuel.



The Pennsylvania situation shows notable firmness, with no weak spots anywhere. Certain coals have been marked up another 5¢@10¢. only this week, and an adequate demand is still forthcoming. Prices all-rail are firm, and operators are wary of selling for deferred delivery; \$1.60 has been paid for certain Moshannon coals within a short time, and when such a price can be realized for Clearfield output, it cannot be said the market is lacking in strength.

Anthracite—Orders are being filed for August coal in surprisingly good number. Dealers are still holding to the policy of carrying full stocks and are taking on cargoes as fast as retail deliveries will permit. There is perplexity over the varying policies of the anthracite companies with regard to charging the Pennsylvania tax.

Current prices on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somerset	Georges Creek	Pocahontas New River
Mines*	\$1.15@1.55	\$1.35@1.70	\$1.67@1.77	
Philadelphia*	2.40@2.80	2.60@2.95	2.92@3.02	
New York*	2.70@3.10	2.90@3.25	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.85@3.00
Boston†				3.98@4.13
Providence†				3.85@4.00

*F.o.b. †On cars.

NEW YORK

Slight tendency to ease up on the low-grade bituminous coals, but the market is well supported. Railroad and industrial consumption continues heavy. Hard coal dull, but has an excellent undertone indicative of a good latent strength.

Bituminous—There was a slight tendency to ease up in the soft-coal market during the past week, but it did not extend beyond the low grades. Even the most conservative interests in the trade are agreed that there is little probability of the market developing any weakness until navigation closes on the lakes, at least. Even then the winter's demand will be up to the maximum. Railroads are particularly good buyers, while the general steam consumption seems to be large in all directions in spite of the unfavorable reports regarding business conditions generally. The oldest members of the local trade state that they have never known the bituminous trade to be in a stronger position at this period of the year. Not only is the demand heavy on practically all grades, but the business aspects of the trade are also excellent, collections being promptly made. The car supply is short on occasions, but considering the heavy shipments the situation cannot be considered bad as yet. There are no weak spots in the market which are liable to develop to serious proportions. We continue to quote the local market on the following basis:

West Virginia steam, \$2.55@2.60; fair grades of Pennsylvania, \$2.75@2.80; good grades of Pennsylvania, \$2.80@2.85; best Miller Pennsylvania, \$3.10@3.20; George's Creek, \$3.25@3.30.

Anthracite—Hard coal has not experienced any material change during the week, and still continues comparatively quiet, but with a strong undertone that indicates an exceedingly active market this fall. It is stated that the supplies on hand are far below normal, some companies having no stocks at all with the possible exception of a few odd lots of the steam grades.

Some cutting in the circular is being noticed, but on the whole prices are well maintained. Stove still continues in the strongest demand, while egg and pea are being stocked freely. There is plenty of cars due to the mining being restricted from two to four days a week. Indications are that the demand this fall will be far in excess of the productive capacity of the mines.

We continue quoting the New York market on the following basis:

	Circular	Individual	
		Lehigh	Seranton
Broken.....	\$4.70	\$4.45@4.85	\$4.50@4.90
Egg.....	4.95	4.95@5.10	5.05@5.15
Stove.....	4.95	5.10@5.20	5.15
Chestnut.....	5.15	5.25@5.35	5.40
Pea.....	3.50	3.30@3.45	3.35@3.50
Buckwheat.....	2.75	2.15@2.45	2.55@2.75
Rice.....	2.25	1.70@1.95	2.25
Barley.....	1.75	1.30@1.70	1.75

PHILADELPHIA, PENN.

Anthracite trade showing little or no improvement, although there seems to be a fair demand from the New England market. Curtailed mining still continues. Local market dull. The bituminous situation still continues to improve, the market absorbing the entire production, with little or no spot coal for sale.

The anthracite coal industry shows little or no improvement over last week. Under the curtailed operating, quite a quantity of the steam sizes and chestnut coal are going into stock, notably chestnut, for which the demand seems to have dropped off very materially. The market seems to be capable of handling broken, egg and stove, however, although orders are not coming in as freely as desired. The New England business from tidewater still continues fairly good. The large fleets of barges sailing from this port are kept busy with cargoes, and there is quite a tonnage moving in this direction.

The retail trade is preparing itself for the fall. The month of August is essentially refurbishing time; repairs, additions, and the little odd jobs around a coal yard that cannot be looked after when the demand is on, are cleaned up, so as to handle the business in the fall, and from present indications it is going to be active when it does get started.

Sundry complaints are heard here and there about the Pennsylvania state tax, and with many of the companies absorbing it others charging it are having their hands full explaining why. This is probably having the effect of diverting considerable business from its usual channels. The absorption of this tax is being used by many to stimulate business. It is reported, although this cannot be vouched for, that September first may see all operators either charging the tax as a separate item, or including it in the price of the coal; in other words, advancing all sizes to a price that will include the tax which would obviously be a less irritating way of handling the matter.

The bituminous business needs hardly any comment. The same favorable conditions continue to prevail, and quotations of less than \$1.25 for any kind of coal are few and far between. The soft-coal operator is doing probably better than ever before at this season.

BALTIMORE, MD.

Bituminous coals growing scarce in Pennsylvania. All large companies practically covered by contracts. Strike in one region and a general shortage of cars is also having an effect.

Soft-coal men here are well pleased with the general strength of the market. The Lakes are still taking large quantities of coal, in fact to such an extent that the West Virginia gas product is being held at a full dollar all along the line; the better grade Pennsylvanias are already out of the market entirely or fast approaching that state. In not a few sections mines are entirely sold out on contract, and the producers are worrying how to meet the heavy call on contracts, in the face of the growing car shortage. Even if there was enough coal produced to warrant entering the outside market, these companies would find it impossible to seize the opportunity. Others with some coal to sell are fast closing

ing it out, for the most part at \$1.25 or better for even ordinary grades.

Locally the situation is fairly brisk, and while there is no shortage of fuel at tide there is also no surplus reported. Shipments over the piers continue heavy on contract. The foreign movement is keeping up also, and while July with a total of nearly 83,000 tons falls back of the previous month by more than 20,000 tons, it still maintained the average so far this year.

The anthracite trade is beginning to improve. Dealers here are receiving inquiries, and the hard-coal business will be under way in another six weeks.

The influence of the coming hurricane season on southern charters is already being felt. Offerings have been a little less free for the southward coastwise haul, especially by sailing vessels. Tampa is now being quoted up to \$1.30; Savannah is calling from \$1.05@1.10, and Galveston hauls demand from \$1.40@1.50, which are considerably in excess of figures several weeks ago.

PITTSBURGH, PENN.

Mines working up to capacity, with practically no free coal. Contracts hard to make for shipment before Dec. 1. Sufficient Connellsville furnace coke has been taken at the full \$2.50 price to meet uncovered August requirements. Foundry coke slightly advanced.

Bituminous—Mines continue to work up to the limit made by the supply of labor and cars, both of which are moderately satisfactory, resulting in production at close to the very best record. The pressure is particularly for lake coal, although shipments on contract are heavy. There is hardly any free coal, but this is not inconveniencing consumers as they are well covered by contracts against which they are getting fair deliveries, so there is not much demand for prompt lots. Few operators are in position to take on fresh contracts, at least for shipment prior to Dec. 1, when the lake shipping season will have closed. Slack is bringing good prices, usually the full circular figure. We continue to quote as follows: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30; ¾-in., \$1.40; 1¼-in. steam, \$1.50; 1¼-in. domestic, \$1.55, per ton at mine, Pittsburgh district.

Connellsville Coke—The furnace coke price of \$2.50 is very well maintained. Practically all the August coke required by furnaces in operation and not covered by longer term contracts, or otherwise, has now been purchased, at the full price, and the sales for August may be estimated at close to 150,000 tons, or about the same tonnage as was taken for July. In two cases September coke was taken as well as August, involving some 15,000 or 20,000 tons for September, and in one instance a contract was made for 2500 tons monthly, August, September and October. In other cases the buying has been for August only.

Several additional furnaces have blown out lately and production will require further curtailment to keep it in line with consumption, but thus far no spot or prompt coke has been pressing the market. Foundry coke has stiffened slightly, practically all of the few sellers at below \$3 having withdrawn such prices, making the market quotable at \$3. We now quote as follows: Prompt furnace, \$2.50; contract furnace, \$2.50; prompt foundry, \$3; contract foundry, \$3 per ton at ovens.

For the first time in many weeks the "Connellsville Courier" reports shipments of coke at considerably less than production, the figures for the week ended Aug. 2 being: Production, 385,065 tons, a decrease of 8268 tons; shipments, 366,053 tons, a decrease of 27,581 tons. Shipments fell 19,012 tons below production, but it is represented that the surplus was probably by the producer-consumer class, the merchant ovens having no surplus to press on the market.

BUFFALO, N. Y.

Bituminous prices still have an upward tendency, with some new high-priced contracts reported. Consumers not disturbed at an increased slackness in deliveries. Heavy rush of anthracite west by lake.

Bituminous—There is no sign of any easing off in the bituminous trade. During the week contracts for a year have been made here at surprisingly high figures. The more sanguine jobbers are saying that by the middle of October the mine-run price will be \$1.50 for any good coal. While this view is not universal, it is agreed that everything now looks like it. Almost all operators have been buying in the open market, to satisfy contracts. Salesmen are doing special jobs, on account of the utter uselessness of sending them on the road to sell coal that could not be delivered. As a rule, the consumer is not disturbed, and is apparently incredulous at what the selling end of the trade tells him. At the same time the rail deliveries are steadily growing slower. The movement is indicative of a very limited motive power,

or a material increase of other freight. When a car reaches a siding at a junction point it usually stays there till the shipper hunts it up and goes after the road. The grain crops are now moving and the situation is sure to grow worse from this time on.

Bituminous prices are as strong as formerly, and are quotable as before with an upward tendency, as follows: Pittsburgh lump, \$2.90; three-quarter, \$2.80; mine-run, \$2.65; slack, \$2.15, with Allegheny Valley about 15c. lower.

Coke—There is a somewhat increased activity in the coke trade. Some of the pig-iron furnaces in this vicinity that shut down last month, have started up again and others are in prospect of doing so. There is probability of a change in that trade before long, however, on account of the uncertainty of the future of the Connellsville district. Quotations remain on the basis of \$2.65 for best Connellsville foundry.

Anthracite—This trade is featureless and nothing expected till there is sign of colder weather. Western shippers are giving almost their entire time to rushing coal forward by lake, and the figures are already far ahead of those of former seasons. To Aug. 1 last season, the shipment was only 1,987,385 tons, which was about the same as the year before, and not exceeded in former seasons as a whole; shipments this season to August are 2,566,206 tons from Buffalo, with every prospect of keeping up the pace. The July shipment of 780,000 tons again broke the monthly record, as has been done once or twice before this season. Lake shipments for the week were 175,000 tons.

COLUMBUS, OHIO

Market steady in every respect. Aug. 1 price list is well maintained. Some car shortage appearing in all the mining districts. Good demand for steam and domestic sizes continues and lake trade is strong.

Strong quotations and steadiness were the chief features of the trade in Ohio during the past week. The demand for all grades continues good and the movement all that could be expected for the time of the year. About the only disturbing factor is the increasing car shortage which had the effect of curtailing the output in all sections of the state. The tone of the market is good and future prospects are considered bright.

Domestic demand is increasing as the fall approaches; many of the larger consumers have placed their orders and dealers are pretty busy making deliveries. Stocks are fair, but with the volume of business being done, orders for immediate shipment are necessary. There is also a considerable trade in domestic sizes for deferred delivery, although there is a disposition to go slow in booking such orders. Threshing is producing quite a good business in all rural sections.

Steam business is also strong and as a result prices show no weakening. Factories are requiring a considerable tonnage to keep going and in many cases their fuel requisitions are being increased. No stocking is being done as yet as purchasing agents believe that prices will not advance materially from this time on. The demand from railroads for fuel is also strong as the freight movement is holding up well. The shipments to the Northwest via the lakes are heavy and no let up of consequence is reported. Lake shipments through the Hocking Valley docks at Toledo so far this season total 1,572,000 tons.

Because of the car shortage, the output during the week was somewhat less than normal. In the eastern Ohio district the shortage of equipment was the most serious and the output is estimated at 75 per cent. of the average. Some shortage was also reported from the Pomeroy Bend and the domestic fields. In the Hocking Valley, a freight wreck of some seriousness had the effect of aggravating the situation.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburg	Pomeroy	Kanawha
Domestic lump.....	\$1.70 @ 1.65	.....	\$1.70 @ 1.65	\$1.70 @ 1.65
3-4 inch.....	1.55 @ 1.50	\$1.30 @ 1.25	1.45 @ 1.40	1.50 @ 1.40
Nut.....	1.30 @ 1.20	.....	1.35 @ 1.30	.....
Mine-run.....	1.35 @ 1.25	1.15 @ 1.10	1.30 @ 1.25	1.20 @ 1.25
Nut, pea and slack..	0.70 @ 0.65	.....	0.60 @ 0.55	0.65 @ 0.70
Coarse slack.....	0.60 @ 0.55	0.75 @ 0.70	0.50 @ 0.45	0.55 @ 0.50

HAMPTON ROADS, VA.

Supply of coal at tidewater normal. Demand good and prices firm. Dumpings for the week heavy and prospects excellent for a record month.

Dumpings at Hampton Roads piers for the week have been heavy. This is particularly true as regards coal moving from Sewalls Point as loadings there have been very heavy. There have been a number of large cargoes moving coastwise and the foreign business has also been good; the shipments have moved to Genoa, Dakar, Valparaiso, St. Lucia, Para and Menos.

Prices for New River and Pocahontas have remained firm,

although there is a fair accumulation of coal on all terminals. There has been some demand for Kanawha coal at \$2.50 to \$2.65, but few sales have been made at the latter figure.

While the dumpings for August may not break the record of previous months at the same time it is predicted by those in position to know that the figures will run considerably over the quantity dumped the same month last year.

LOUISVILLE, KY.

Deficiency in the car supply is causing a shortage which is quite acute on some grades. Demand from the Northwest continues heavy. Industrial and railroad consumption large.

The feature of the local situation is abnormal scarcity of nut and slack at the consuming centers in spite of the rather heavy domestic demand. This is due to the inadequate car supply, for which there is no immediate indication of any improvement. The demand from the Northwest for the prepared grades is still heavy, and most mines are receiving only a fraction of the required equipment for loading. The situation is most acute in the eastern Kentucky field, but applies also to the western district, though probably not so severe.

A heavy demand from the Illinois Central Railroad is tending to further complicate the situation. This road participated in the heavy storing movement, which was general among the railroads some time ago when prices were low, but they still appear to be short and are concentrating their efforts on their own requirements to the detriment of the other freights generally. The industrial consumption is heavy, and there is grave danger of something on the order of a famine developing unless the railroads effect a rapid improvement in the car situation.

The steadily increasing demand for nut and slack of the better grades has put this on a selling basis of 90c., which is more nearly the winter market; the lower grades are quotable at 65 to 75c., with pea and slack strong at 40c. Eastern Kentucky grades continue unchanged at previous quotations, with western Kentucky now quotable at \$1.10 for lump, 95c. for nut, and 85c. for mine-run.

BIRMINGHAM, ALA.

A noticeable slowing up in consumption. Coal accumulating on track and dealers are requesting shipments held up.

A pronounced slackening up of orders and requests for delays in shipments on contracts, were the principal items of interest in the coal trade during the current week. As a consequence there is some accumulation on track at various points. Prices have not suffered to any appreciable extent, but unless there is immediate improvement in conditions we may expect lower prices all along the line.

Reports from the state mine inspector's office are to the effect that Alabama mines are now producing coal at the rate of about eighteen million tons per year, which is approximately a 10% increase over the tonnage mined in 1912.

There is no apparent change in the foundry or furnace coke markets.

NEW ORLEANS

Harbor demands heavy. Exports curtailed because of threatening weather at this period of the year. Severe car shortage impending.

Sawmills were among the largest buyers of steam grades during the past week. Most of the mills in this territory use coal as fuel rather than wood, as they are mostly located on rivers where delivery is cheap. Harbor demands were again heavy. With the large crop movement soon to begin and with the prospect of heavier exports than ever before, local dealers are preparing for an unusual demand from shipping interests. The only exports of coal during the week were to Ceiba and Tela, Honduras. Coal shipments to Caribbean points are curtailed as much as possible at this time of year, owing to the hurricane seasons.

While the railroads are still filling orders for cars with reasonable promptness there is plenty of evidence of the approach of an unusually severe car shortage. Alabama stock continues to be moved in as fast as possible. Unusually heavy demands for coal from Texas points is calling for many cars and every effort is being made to get these orders off. No changes in quotations were made during the week.

CHICAGO

Strong demand for smokeless coals and advances in price already made will probably be followed by others. Quotations on screenings have dropped. A scarcity of smokeless lump and egg is reported. The anthracite market is stronger and there is an increasing volume of orders for coke.

Demand for domestic coal, especially the Western variety, is improving steadily. Franklin County operators have advanced their prices to \$1.60 a ton, f.o.b. mines, and a large volume of orders are being received at this figure. Carter-

ville operators report a substantial increase in the demand for that coal, and during the next five months it is expected they will be exceptionally busy filling orders. Cartersville lump and egg is selling at prices ranging from \$1.40 to \$1.50 f.o.b. the mines, and higher prices are anticipated.

There has been a marked decrease in the demand for screenings and prices have dropped from 10c. to 15c. a ton; this is attributed chiefly to an oversupply. A scarcity of smokeless lump and egg is reported. The circular price for August on that coal is \$2.25, but what little of it appears upon the spot market commands \$2.50 and in some instances sales at \$2.65 have been recorded. An unusual demand prevails for smokeless mine-run and it is believed in some quarters that there will be a shortage of that fuel within the next four months. This applies not only to the smokeless coals of West Virginia, but also to the low volatile central Pennsylvania grades.

According to a number of dealers, there has been a distinct betterment in the anthracite market and the demand for coke is steadily growing.

Prevailing prices at Chicago are:

	Springfield	Franklin Co.	Clinton	W. Va.
Domestic lump.....	\$ 2.07	\$2.45@2.65	\$2.27	
Steam lump.....	1.87@1.97		2.07	
Egg.....		2.45@2.65		\$4.30@4.55
Mine-run.....	1.82@1.92	2.30	1.87	3.55@3.65
Screenings.....	1.42@1.52	1.65@1.85	1.42@1.52	

Coke—Connellsville, \$5.50; Wise County, \$5.25@5.50; by-product, egg, stove and nut, \$4.75@4.85; gas house, \$4.65@4.75.

DETROIT, MICH.

West Virginia coal in strong demand and market becoming steadily broader. Car shortage quite acute. Prices directly controlled by the supply, which is limited.

Bituminous—The shortage of railroad cars is the main feature of the local situation, and the trade is of the opinion that there will be an unprecedented shortage the coming fall; this is due to the fact that there was no relaxation during the summer, the demand having been insistent and the consumption heavy throughout the entire season. Slack is the only easy department in the trade, and, while there is no surplus, there are at the same time no rush orders.

As a result of the increased buying and the heavy consumption, prices are stronger on all grades. The first of September will probably see gas-coal quotations on the basis of \$1.40 to \$1.50 for three-quarter lump. The smokeless coals are practically all sold up, and are very firm. The domestic trade is unusually strong, lump and egg having advanced from \$1.65 to \$1.75 with the supply short; dealers who have failed to purchase their requirements of this grade will be in a serious situation when the fall demand opens up. The Pocahontas domestic coals are particularly scarce, lump and egg now being quotable at \$2.25, while it is freely predicted that they will advance to \$2.50 or \$2.75 in September.

The local market is now quotable on about the following basis:

	W. Va. Splint	Gas	Hock- ing	Cam- bridge	No. 8 Ohio	Poca- hontas	Jackson Hill
Domestic lump.....	\$1.75	....	\$1.60	....	....	\$2.25	\$2.25
Egg.....	1.75	....	1.60	....	....	2.25	2.25
Steam lump.....	1.50	....	....	....	....	....	....
4-in. lump.....	1.35	\$1.35	1.25	\$1.25	\$1.25	....	....
Mine-run.....	1.20	1.20	1.20	1.20	1.20	1.50	....
Slack.....	1.00	1.00	0.65	0.65	0.65	....	....

Anthracite—The local anthracite market is steady with prices firm, due probably to the prospective car shortage. The local demand is in excess of the arrivals and premiums of 25c. have been asked in a few cases on egg and stove.

ST. LOUIS, MO.

Steam trade weakening and indications are it will continue. Domestic market stronger, and coal actually scarce. Car shortage reported on practically all roads. This will have a tendency to enliven the market.

The warm weather has not affected the rising market, as far as domestic sizes are concerned; as a matter of fact, coal has been in demand during the past week from the high-grade fields, with a decided shortage. The screenings market continues to drop, Cartersville now being quoted at about 30c., with Standard grades at 25@30c. By the first or fifteenth of September, Cartersville screenings will be down to about 15@25c., and the Standard operators will be lucky if they do not have to pay the railroad companies to dispose of their screenings; the market is absolutely demoralized, and will likely continue so until about November. Of course, this means a sharp advance in screened sizes, and all mines are from one to two weeks behind on the shipments of lump and egg.

The car shortage is getting serious on practically all the

roads in the high-grade fields, and indications are that it will make itself felt to a greater extent within the next 30 days than ever before. The Standard market is coming into its own, as far as the screened sizes are concerned, but steam coal is going backward.

Anthracite is moving slowly, with more coke on the market than there is call for. Very little smokeless is coming in and there is not likely to be any if the outside market continues to soar, as St. Louis will not pay the price.

The prevailing circular is:

	Cartersville and Franklin Co.	Big Muddy	Mt. Olive	Standard
2-in. lump.....	.....	.....	.....	\$0.95@1.00
3-in. lump.....	.....	.....	\$1.25	.....
6-in. lump.....	\$1.40 @ 1.60	.....	1.30	1.20
Lump and egg.....	.....	\$2.10	1.40	.....
No. 1 nut.....	1.20 @ 1.30	.....	1.05	0.87
Screenings.....	0.65	.....	.....	0.80
Mine-run.....	1.50	.....	.....	0.75
No. 1 washed nut.....	1.35	.....	.....	.....
No. 2 washed nut.....	1.20	.....	.....	.....
No. 3 washed nut.....	1.20	.....	.....	.....
No. 4 washed nut.....	1.10	.....	.....	.....
No. 5 washed nut.....	0.85	.....	.....	.....

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

The following is comparative statement of the anthracite shipments for July and the first seven months, of the years 1912-13, in long tons:

	July		7 Months	
	1913	1912	1913	1912
Phila. & Reading.....	902,763	1,217,892	7,761,147	19.24
Lehigh Valley.....	1,011,987	1,144,678	7,604,118	18.85
Cent. R.R. N. J.....	775,550	865,618	5,351,214	13.27
Del. Lack. & West.....	871,677	883,312	5,661,037	14.03
Del. & Hudson.....	589,589	687,843	4,094,128	10.15
Pennsylvania.....	439,912	545,655	3,607,018	9.94
Erie.....	683,161	708,568	4,762,953	11.81
Ont. & Western.....	213,213	231,587	1,498,091	3.71
Total.....	5,487,852	6,265,153	40,339,706	100.00

Stocks at Tide on July 31 were 537,404 tons, an increase of 4375 tons. Stocks on same date of previous years were:

	1907.	1908.	1909	1910	1911	1912	1913
	645,030	886,653	1,006,195	896,064	826,396	380,088	537,404

LAKE SHIPMENTS

Anthracite Shipments through the Sault canals for the current year to Aug. 1 were 1,425,554 tons as compared with 505,225 tons for the same period last year.

Bituminous Shipments for the same periods were: 7,986,881 for the current year as compared with 5,981,229 in 1912, making gross of 9,412,435 for 1913 and 6,486,454 in 1912.

THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Aug. 1, as follows:

	Surplus	Shortage	Net*
New England Lines.....	124	144	20
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.....	1,024	300	724
Ohio; Indiana; Michigan; Western Pennsylvania.....	340	1,263	923
West Virginia, Virginia, North & South Carolina.....	709	1,612	903
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida.....	150	425	275
Iowa, Illinois, Wis., Minn.; North & South Dakota.....	1,556	135	1,421
Montana, Wyoming, Nebraska.....	202	0	202
Kansas, Colorado, Missouri, Arkansas, Oklahoma.....	2,486	25	2,461
Texas, Louisiana, New Mexico.....	195	53	142
Oregon, Idaho, California, Arizona.....	2,024	72	1,952
Canadian Lines.....	0	0	0
Totals.....	8,810	4,029	4,781

*Bold face type indicate a surplus.

FOREIGN MARKETS

GREAT BRITAIN

Aug. 1.—In view of the nearness of the August holidays, business is very quiet and prices are unchanged as follows:

Best Welsh steam.....	\$4.80@5.04	Best Monmouthshires.....	\$4.08@4.20
Best seconds.....	4.56@4.68	Seconds.....	3.96@4.02
Seconds.....	4.32@4.50	Best Cardiff smalls.....	2.46@2.52
Best dry coals.....	4.32@4.56	Seconds.....	2.34@2.40

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

British Exports—The following is a comparative statement of British exports for June and the first six months of the last three years, in long tons:

	June		6 Months	
	1912	1913	1911	1913
Anthracite.....	189,973	218,814	1,169,675	974,193
Steam.....	3,928,199	4,397,791	22,985,294	18,720,167
Gas.....	1,161,590	986,510	5,074,073	4,487,837
Household.....	154,856	144,792	713,568	640,455
Other sorts.....	322,026	258,503	1,551,349	1,350,671
Total.....	5,756,644	6,006,410	31,493,959	26,173,323
Coke.....	51,139	75,336	462,559	388,108
Manufactured fuel	108,649	185,162	851,867	635,283
Grand total....	5,916,432	6,266,908	32,808,385	27,196,714
Bunker coal.....	1,561,215	1,721,016	8,125,897	10,087,037

FRANCE

French imports and exports for the first five months of this year and last year were as follows:

	Imports		Exports	
	1913	1912	1913	1912
Coal.....	7,543,700	5,708,100	583,299	929,194
Coke.....	1,389,800	1,086,500	97,021	67,618
Briquettes.....	439,900	447,900	74,091	87,662

BELGIUM

The following are the Belgium imports and exports for the six months of the current year:

	Exports		Imports	
	1912	1913	1912	1913
Coal.....	2,451,753	2,400,839	3,884,851	4,482,544
Coke.....	463,406	520,291	454,372	610,361
Briquettes.....	338,828	282,969	201,295	236,557

EGYPT

Coal imports into Egypt for the year of 1912 amounted to 7,783,490 tons, as compared with 6,486,214 tons in 1911. The principal shippers were England, which furnished 89%, the United States with 6%, and Germany with 4%.

SPANISH IMPORTS

Coal imports into Spain for the five months to May 31 of the current year were 1,161,841 metric tons, as compared with 883,372 tons for the same period last year. Coke imports for this period of the current year were 156,495 tons as compared with 169,516 tons for the same period last year.

COAL FREIGHT DECISIONS

Suspension Docket No. 196—Switching Charges at Chicago (Chicago, Milwaukee & St. Paul Ry.).

- Coal consigned to stations on the Chicago, Milwaukee & St. Paul Railway in Chicago is delivered to that carrier at Galewood, a station on its rails within the switching limits of Chicago. Heretofore the Chicago, Milwaukee & St. Paul has received for its service from Galewood \$4 per car out of the joint rate from the mines, plus 10c. per ton on all excess over a given weight from the shipper. It now demands 20c. per ton. The carriers to Chicago contend that they cannot afford to absorb the additional amount over the present \$4 per car and accordingly filed tariffs in cancellation of the joint rates, leaving the shipper to pay the Chicago rate plus the 20c. per ton now demanded by the Milwaukee, minus, however, the \$4 per car which the carriers from the mines are willing to continue to absorb. **Held:** That the resulting advance in the rate to the shipper is not justified and the proposed tariffs should be canceled.
- Switching conditions in Chicago leading up to the establishment of the present basis of charges and absorptions in the Chicago switching district, as published in the Lowrey traff, discussed. **Opinion No. 2314.**

I. C. C. No. 3538—Consolidation Coal Co. (of Maryland) vs. Baltimore & Ohio R.R.

Allegation that unreasonable charges result from the initial carrier's failure to furnish cars of the capacity ordered by shipper not sustained. **Opinion No. 2318.**

I. C. C. No. 4480—Shoal Creek Coal Co. vs. Toledo, St. Louis & Western R.R.

Advances in rates on bituminous coal from Panama, Ill., mines to Burlington, Fort Madison, and Keokuk, Iowa, not justified by defendants. **Opinion No. 2319.**

I. C. C. No. 3854—Coke Producers Association (Connellsville) vs. Baltimore & Ohio R.R.

Rates on coke in carloads from the Connellsville producing region of Pennsylvania to various destinations are attacked as unreasonable per se, unjustly discriminatory, and unduly preferential; **Held:**

- That the rates to Youngstown, Canton, Cleveland and Toledo, Ohio; North Cornwall, Robeson, Reading and Philadelphia, Penn.; Baltimore, Md.; and Newark, N. J., are unreasonable per se.

- That the present relationship of rates as between the Connellsville district and the Fairmont district in West Virginia is not unduly discriminatory against Connellsville or unduly preferential to Fairmont and must be maintained.

- That participation by defendants in through rates from West Virginia and Tennessee fields, which yield lower earnings per ton-mile than their rates from the Connellsville field, is, under the conditions of competition between carriers which defendants cannot control, neither unduly discriminatory nor unduly preferential. **Opinion No. 2324.**

I. C. C. No. 3998—Memphis (Tenn.) Freight Bureau vs. Louisville & Nashville R.R.

Rates of \$1.10 per ton on coal from western Kentucky and Alabama mines not found to be unreasonable. Complaint dismissed. **Opinion No. 2229.**

COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending Aug. 9:

Stocks	Week's Range			Year's Range	
	High	Low	Last	High	Low
American Coal Products.....	82	82	82	87	80
American Coal Products Pref.....	105	101	101	109½	105
Colorado Fuel & Iron.....	32½	30½	31½	41½	24½
Colorado Fuel & Iron Pref.....	195	190	190	155	150
Consolidation Coal of Maryland.....	102½	102½	102½	102½	102½
Lehigh Valley Coal Sales.....	195	190	190	190	190
Island Creek Coal Com.....	52½	49	51	52½	47½
Island Creek Coal Pref.....	82	82	82	82	80
Pittsburgh Coal.....	19½	18½	19	24½	14½
Pittsburgh Coal Pref.....	85½	82½	84½	95	73
Pond Creek.....	22	20	21½	23½	16½
Reading.....	161	158	158½	168½	151½
Reading 1st Pref.....	88½	88½	86	92½	86
Reading 2nd Pref.....	88½	88½	88½	95	84
Virginia Iron, Coal & Coke.....	40	40	40	54	37½

Bonds	Week's Range			Year's Range	
	Closing Bid	Asked	or Last Sale	High	Low
Colo. F. & I. gen. s.f.g. 5s.....	93½	98	95½	July '13	93½
Colo. F. & I. gen. 6s.....	103	107½	107½	June '12	99½
Col. Ind. 1st & coll. 5s. gu.....	82	Sale	82	83	77½
Cons. Ind. Coal Me. 1st 5s.....	92½	93	93	June '11	85
Cons. Coal 1st and ref. 5s.....	92½	93	93	Oct. '12	85
Gr. Riv. Coal & C. 1st g 6s.....	100	102½	102½	April '06	98
K. & H. C. & C. 1st s f g 5s.....	98	98	98	Jan. '13	98
Pocah. Con. Coll. 1st s f 5s.....	85½	86½	86½	June '13	86
St. L. Rky. Mt. & Pac. 1st 5s.....	80½	82½	80½	73	80½
Tenn. Coal gen. 5s.....	99	99½	99½	99½	103
Birm. Div. 1st consol. 6s.....	101	102	101	April '13	101
Tenn. Div. 1st g 6s.....	101	102	100½	July '13	100½
Cah. C. M. Co. 1st g 6s.....	103	103	103	July '13	103
Victor Fuel 1st g 5s.....	80	80	80	May '13	80
Va. I. Coal & Coke 1st g 5s.....	92½	93	92	92½	98

No Important Dividends were announced during the week.

Rocky Mountain Fuel Co. (Denver)—This company, reincorporated in Wyoming, has arranged to increase its capital stock from \$8,000,000 to \$10,000,000 preparatory to making an issue of \$10,000,000 new bonds, of which \$4,000,000 will be reserved to retire the \$4,000,000 5% bonds of 1911, and the remainder will be used for extensions and additions, as required.

American Coal Products Co.—This concern was incorporated under the laws of New Jersey, Feb. 6, 1903, and owns and operates, through its subsidiaries, some forty plants for the manufacture of coal products, which are scattered in 37 cities of the United States and Canada. The company owns all the stock of the United Coke & Gas Co. and nearly all of the stock of the Barrett Manufacturing Co.; also has an interest in the United Coke & Gas Co., which took over the by-product, coke ovens and other patents comprising the Otto, Hoffman and United Otto system of construction.

Texas & Pacific Coal Co.—This concern owns 60,000 acres of coal land in Texas and on Apr. 20, 1910, stockholders voted to increase authorized stock from \$2,500,000 to \$3,500,000, but to June, 1912, no new stock had been issued. The company has been declaring dividends at about the rate of 1½% per quarter, regularly.

The Alabama Consolidated Coal & Iron Co.—The reorganization plans of this company provides for an assessment of \$30 per share on preferred and \$15 on the common. It is also proposed to issue \$1,000,000 of 6% 20-year bonds of which \$550,000 will be sold which, together with the assessment, will be used for paying off the indebtedness of \$1,150,000; the new capitalization will be \$7,869,000 as against \$6,969,000 as at present.